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CIVILIAN HEALTH IN WAR TIME

CHAIRMAN'S ADDRESS

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NEW YORK

It is appropriate that, while dedicating medicine to the maintenance and betterment of the health of our nation in this time of war, we celebrate the first century of public health, which had its origin and took definite purpose and form with the publication of that classic "A Sanitary Survey of the Labouring Population of Great Britain" by Edwin Chadwick and his medical collaborators, Drs. Southwood Smith, James Phillips Kay and Neil Arnott.

At the very outset of this hundred years of progress in public health, philosophers in this country reminded the people that health is the first wealth, and the pomp of emperors becomes ridiculous by comparison.

Increasingly intelligent and liberal application of the sciences and practical arts of preventive medicine through local, state and federal government has been interrupted only by periods of war, and even during these interludes of destruction the compelling need for manpower and the lessons learned in mass management of men under arms and in supporting trades and industries have stimulated the people and their agents in public service to increased efforts, with the result that each war has been accompanied and followed by greater concern and improvement in the nation's health.

We can say with honesty and accuracy today, as our predecessors have been able to declare annually since the last war, that all the indexes of improving health are favorable. I would not have you understand from this that there is no ignorance, poverty, neglect or incompetence among us resulting in great masses of residual and wholly preventable disease. It is, however, necessary to recognize the true and relative excellence of the health of our people now as compared with any previous year or with the health of any comparable population aggregate of races elsewhere under any form of government, so far as we have human records. Furthermore, there is no present or reasonably predictable threat to the continued improvement of the health of our civilian population from the contingencies of war if we do but hold firmly to the methods we have found effective and use thriftily the professional, material and nutritional resources available to us.

Famine and pestilence, the traditional enemies of man's security and survival, do not face us with any real hazard today. Even the fears of fanatics, the fantasies of faddists, cannot create a danger of food shortage, and there are only two epidemic diseases against which we have neither the warning of a calculable approach nor means for prevention and control when once they become manifest. These are influenza and poliomyelitis. Neither of these diseases is necessarily or otherwise than accidentally related, and certainly not causally, to wars and their disturbances of commerce and human intercommunication.

There are perhaps only two categories of disease on which the effect of war will probably be unfavorable: those affecting chiefly persons in the later two or three decades of life and those related to the dislocation of normal social relations and due to an attitude of recklessness in the face of life's uncertainties and frustrations. With emphasis necessarily and rightly placed on health and fitness of men and women of the ages of military and industrial usefulness, there may be less than the desirable and humane care and possible prevention of such major causes of death as prevail among persons of 65 and over—cancer, diabetes, heart diseases and arteriosclerosis. The biologic urge of sex expression and the fallacious sense of self satisfaction and release attained through the use of alcoholic beverages are closely linked to the increasing prevalence of venereal infections. We may expect in the civilian as in the military population an increase in the direct and indirect effects of alcoholism and syphilis in this wartime unless there is something like a revolution in the social attitudes toward both liquor drinking and venery. Every alcoholic and syphilitic person is an obstruction to military and civil preparedness for national offense.

What then are we, the physicians of the country, and our patients, such of us as remain unregimented and out of uniform, to do and to advise so that there will be the least possible loss in national health or, better still, that in winning the war we shall also be building a way of life better worth fighting for—a life with added depth and breadth, and richer in quality as well as longer in years of enjoyment and contributing happiness to others?

What have been the factors of enduring worth responsible for the consistent and nationwide improvement in health in the interwar quarter century since 1917?

Let me indulge in but one statistical reference to the improved mortality experience of our industrial and wage earning men and women and their families, among whom the general death rate from all causes has fallen 54 per cent and the specific death rates from seven important communicable diseases together have fallen 82 per cent in the past twenty-five years, as shown in the accompanying table.

Then too those most sensitive indexes of good medical care, maternity and infant death rates, have reached unprecedented low points in the past five years, most significant evidences of a constructive rising regard

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for human life. And yet we see clearly that we collectively and publicly apply much less than we know individually and professionally of the facts and uses of preventive medicine.

Not quite 70 per cent of our population live under forms of local government which include public service for health by medical officers employed full time at public expense. And of the full time local county and city health officers now on duty scarcely half have had the graduate professional education and practical field experience to qualify them for their duties.

Furthermore, in about half of the counties with full time health officers there is neither the supporting accessory personnel for sanitation, nursing, laboratory and statistical technic required for the area and population nor reasonable security through civil service against removal for political reasons, regardless of the quality of the services rendered.

We know that the public application of preventive medicine under the authority of the law and using tax resources is indispensable in our social, economic and political setting. Where it has been consistently used there has been excellent achievement locally and in whole states, as in Wisconsin, Minnesota and New York and in other areas less extensive.

Fall in Death Rate, per Hundred Thousand, of Seven Communicable Diseases

Syphilis	from	19	to	9.0
Typhoid	from	12	to	0.4
Measles	from	10	to	0.8
Diphtheria	from	22	to	0.7
Pneumonia	from	132	to	23.0
Tuberculosis	from	2,020	to	40.0
Diarrhea and enteritis	from	25	to	2.0
	from	422	to	75.9

FULL TIME HEALTH SERVICE

The first objective of the medical profession now should be to encourage and demand for the sake of their patients a total coverage of the national area and of the population by full time health service, on a county or district basis, responsible to local government and receiving expert specialist assistance and consultative advice from the respective state department of health.

To accomplish this I consider the first obligation of the county, district and state medical societies, with the central support and encouragement of the Trustees and headquarters staff of the American Medical Association. It took the American Medical Association and the American Public Health Association and many helpful voluntary and commercial agencies interested in health thirty-one years to cover the nation with model state vital statistics laws, which ultimately made possible the declaration of a national birth and death rate.

It should not take five years to set up and staff local departments of civil government under full time trained medical officers of health so that indispensable basic protective, preventive and constructive health services would be accessible to every person, family, household and place of employment in continental United States and its insular possessions.

There are not less than forty million people in continental United States now who fail to receive from local and state government what some ninety-two million of their fellow citizens are benefited by.

Among the important reasons for the sustained excellence of general health in Great Britain, even under the cruel handicaps of bombardment, food shortage and dislocation of living and working conditions these past two years and a half, has been the maintenance of total coverage health service under local or regional government control by civil service experts in public health. Regardless of troop movement or evacuation, emergencies of production or transportation, every inch of England and each least person and village has had the protection of a public health service of uniformly good quality, respected and assisted by the practitioners of medicine chiefly concerned with care of the sick. Meningococcic meningitis and tuberculosis among children have increased in some seasons in each year, apparently as the result of the long continued use of shelters against bombing and incendiary air raids. Except for these and the slightly increased occurrence of localized outbreaks of enteric infections due to food, the health of England has been as good as in the recent prewar years, and in respect to maternity, infancy and the common communicable diseases of childhood the record has been better since 1939 than it was before.

We must and can do as well or better in this country, but for this purpose we must have health services over all the nation at the earliest possible date.

NECESSITIES IN CARE OF THE SICK

Second, if at all, to the necessity of universal availability of public health services is that for the trio of indispensables in care of the sick, the family physician, the local or regional general hospital and a visiting or bedside nursing service.

Even deducting the 23,400 physicians needed for men under arms and the 22,000 who are not fit for active practice or are already diverted into other pursuits, there will remain a ratio of 1 physician for each 988 of the population—a number ample for all necessary medical purposes if distributed according to population rather than in response solely to the physicians' personal economic and social advantages and preferences.

England and Wales have approximated adequacy according to their standards with a ratio of 1 physician to 1,490 persons, and Sweden satisfies her people with a highly organized staff providing 1 physician for each 2,890 of the population.

Care of the sick in wartime as in peacetime is something other than health service and is the first claim of the public on medicine, but good care of the individual sick includes on the family basis the best opportunity to guide and protect personal health. Unless diagnosis and treatment of sickness is available to all, health protection on the personal or public basis cannot function. Back of the public health service is therefore a reasonably uniform and accessible care of the sick by the individual family physician. For the practical use of those skills of diagnosis and treatment which the sciences have put into our hands, the hospital is a shop which the physician must have for the 10 per cent or so of his patients who cannot be otherwise well cared for. To bring to the bed patient at home the kind of nursing care the hospital offers, and to reduce the number of calls on the sick required of the physician, the visiting bedside nurse is our profession's most valuable assistant.

The community which cannot command the services of a physician, access to a hospital within 30 or 40

miles, and a visiting nurse is in a worse dilemma than if it was without a full time trained medical officer of health.

These necessities of health and care of the sick appear to me to present the medical profession with enough unfinished business to demand its immediate, united and sustained attention, until they are met in a manner consistent with the usefulness of medicine, and within the resources of each community, alone or assisted by those of the state and probably in some instances but certainly in a small minority by federal grants. Local responsibility and resources will generally go further and produce more tangible results per dollar spent than will those of either state or federal government. State aid can be shown to be commonly adequate to meet the health needs of its few county or district areas which cannot support their own local services.

There are some states whose economic dependence and tax limitations are such that only by obtaining federal grants can even the minima of medical services be obtained for some counties. Federal subsidies to all states regardless of proof of the financial need in each instance lead to extravagance, log rolling and a great variety of political abuse without commensurate or offsetting benefits to local government health functions.

WORK TO BE DONE

If we can assume that there will be within practical reach the full time health officer, the practicing physician, the hospital, the visiting nurse and I may properly include the dentist, what is the order of importance of work to be done for national health?

With greatest brevity may I list them by putting the following critical questions?

Is the water known by test and by sanitary inspection of source to be safe to use for drinking, personal cleanliness and food preparation?

Is all human and animal and household waste, from places of residence, work, play or travel, so disposed of as not to pollute water sources or foodstuffs or to foul the soil where people may track dirt into homes?

Are all persons employed in trades and businesses, factories, shops and field so protected by physicians and their colleagues, the public health engineers and industrial sanitarians, that none suffer from avoidable environmental hazards of their chosen occupation? Not only for maximum production but for optimum quality and endurance of the workman, he and his employer are entitled to expert guidance in respect to the physical and psychic factors of each job or process.

Such protection, in addition to being a direct obligation of the employer whether individual, corporate or governmental, should be supplied where necessary by the local and state departments of health, through appropriate divisions or bureaus of occupational hygiene and sanitation.

Is all milk used fresh and fluid from healthy cows and pasteurized before delivery?

Does the diet of the average healthy child and adult include a quart or pint respectively of whole milk or its equivalent, about 40 per cent of the calories from whole wheat or enriched flour bread or the equivalent in whole grain cereals, an egg a day, a fruit and leafy vegetable, butter or its equivalent in other edible fat, potato or its equivalent in rice or macaroni, and cheese, meat or fish once a day?

Sugar and alcohol we can get along without and maintain the highest level of health. Sugar carries no hazard if used in moderation and as one of the pleasant flavors of foods, but not to an extent of replacing other carbohydrates of superior value. Sugar as a flavor tempts many to use it as a food. It is a very inferior food and not essential. Alcohol can be so used with food in moderation and in beverages of low percentage as to cause no obvious damage to health, but alcoholic beverages do not benefit health, and common experience shows how easily excess and habituation lead to accident, disease and deterioration of physical and mental fitness.

Few obligations of the physician are so obvious and permanent, and especially in war time, as that of counseling all, both well and sick, in matters of nutrition and the judicious uses of foods and drink according to age, employment and conditions of climate.

The great and little things of human nutrition are well known medically and should convince us of the value of a general diet without excess and without deficits.

The dairy and the garden, the green grocer, fruiterer and milk man are the best sources of vitamins for normal people, and not the druggist or department store.

Increase in the occurrence of syphilis and of other venereally acquired communicable and preventable diseases is the most conspicuous recent experience of the men under arms and of young women of the civilian population who engage in commercial prostitution or clandestine extramarital sex indulgence. Unlimited and practically uncontrolled access to alcoholic beverages of all strengths by both military and civil patrons of the liquor trade is certainly a potent contributory factor in the increase of commercial prostitution and of the resultant rise in venereal infections.

There is no evidence that the considerable amount of physical and mental unfitness for military service found in the process of examining our millions of young men is due to neglect or inadequacy of medical services for the sick. Such a conclusion would be erroneous and misleading. The great majority of the men rejected for military service have been excluded for conditions in no way incompatible with the continuance of their normal civilian activities or affecting their standard of living. The causes of these rejections do not reflect on the adequacy of medical care of the sick in the United States but chiefly if not wholly on the lack of intelligence and initiative among the draftees who have failed to take advantage of the knowledge and medical and dental facilities well within their reach and means.

SUMMARY

I find that, with the single exception of the upward trend of venereal infection among a considerable and most precious fraction of our population, all evidence across the nation and from all levels of society is of an excellent present state of health.

To hold and better this requires a completion for every state and county of public health services now available to a majority of our people. Supplementing this must be an equally complete provision of professional and institutional services for the sick of a kind widely but not everywhere provided.

Some basic requirements of general and industrial sanitation and of food usage are not everywhere or intelligently met.

We face no emergency of epidemic, no threat of deterioration of our national health, by any of the contributions we have been so far called on to make to a total offensive against the Axis powers.

National health in war or in peace is a personal matter. Public health is but the composite expression of a multitude of individual healths.

Health is our way of life guided as we may choose by the advice of that practical biologist, the general practitioner of medicine, supported in his efforts for the individual by the services of the community whose agent of preventive medicine is the trained medical officer of health.

Civilian health in our wartime is of a high order. We can lift it to new heights if we will for the duration and beyond.

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POLIOMYELITIS FOLLOWING TONSILLECTOMY IN FIVE MEMBERS OF A FAMILY

AN EPIDEMIOLOGIC STUDY

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The K family of Akron, Ohio, consisted of father, mother and six children, E11, R9, J8, B7, M6 and L2½. In August 1941 they were well and active. On August 22 the five oldest children were subjected to tonsillectomy; the four oldest also had teeth extracted. On August 31 B7 took sick and became progressively worse. By September 5 the five children who had been operated on were acutely ill; all developed severe bulbar poliomyelitis, and by September 9 three of them had died. Two survived. The father, mother and one child who had not been operated on showed no signs of illness. These facts were reported by Krill and Toomey.[1]

The association of recent tonsillectomy and the bulbar form of poliomyelitis during prevalences of the disease has been recently summarized by Aycock.[2] In the present instance, however, the city of Akron (population about 270,000) was relatively free of poliomyelitis. Only 2 scattered cases had occurred prior to the onset in the K family, and no contact, direct or indirect, could be established. No subsequent epidemic occurred, although there were 6 additional cases in September. While the family associations were diffuse there was no recognized exposure to cases of known or suspected poliomyelitis. The present investigation was undertaken, therefore, in an effort to disclose the source of infection through epidemiologic studies combining both ecologic and laboratory approaches.

FAMILY HISTORY

A review of the activities of the K family revealed numerous associations, which are detailed chronologically.

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From the Department of Epidemiology and the Virus Laboratory, School of Public Health, University of Michigan, Ann Arbor, Mich.; Children's Hospital, Akron, Ohio, and the Department of Pediatrics, Western Reserve University School of Medicine, Cleveland.

1. Krill, C. E., and Toomey, J. A.: Multiple Cases of Tonsillectomy and Poliomyelitis, J. A. M. A. **117**: 1013 (Sept. 20) 1941.
2. Aycock, W. L.: Tonsillectomy and Poliomyelitis: I. Epidemiologic Considerations, Medicine **21**: 65 (Feb.) 1942.

For a period of three weeks, beginning about July 1, 1941, the mother, father and four oldest children visited with an aunt (Ba) who lived on the shore of a small lake near Akron. The aunt was invalided with postencephalitic Parkinson's syndrome, and Mrs. K took care of her during the visit. The visitors were well during the holiday and returned home in good health.

The two youngest children, L2½ and M6, stayed during the same interval with an uncle and aunt (Be) in Youngstown, Ohio, 50 miles away. The Be family had two children, W5 and D3. During the last week of this period W5 was irritable; he was taken to a physician, who recommended tonsillectomy. At the same time the physician also examined the K girl, M6, and stated that her tonsils were badly infected; this observation was the starting point for subsequent procedures. The Be boy was operated on two days before the two K children returned home. Convalescence proceeded normally until the beginning of the third postoperative week, when the patient exhibited "general weakness," would not or could not eat well and had to be fed by his mother for about one week. Thereafter no abnormalities were noted. There was no further contact between the K and Be families except for a period of less than a half hour on August 20, when the Be family visited in Akron.

July 27 to 31: Mrs. K visited Fremont, W. Va. She traveled alone and encountered no children or any apparent sickness on the trip.

In the next few weeks nothing apart from the usual family activities is recorded.

August 16 to 18: Mr. and Mrs. K went fishing with friends in Danville, Ohio. All of the K children stayed for the two days at the home of a maternal aunt (McH), who lived about eight blocks away from the K family. There were four children, G9, C8, R7 and R6, in this family. An additional cousin, M12, of the same name but of a different household, visited with the group at this time but at no later date. No history of any illness was found in the McH family.

August 19: Mrs. K took the five oldest children to a physician for examination of their throats. It was recommended that all have their tonsils removed, and arrangements were made for August 22. That night the father had a headache and stayed home with the youngest child while all the others went to a ball game.

August 20: The Be family from Youngstown, Ohio, visited for a short time.

August 21: E11, J8 and B7 went picnicking and fishing with some friends at Erie Pond. The pond was located about eight blocks away, near railroad tracks. Approximately 100 by 50 yards, it was filled with rushes and stagnant water. Along the banks refuse was dumped, and garbage was floating in the water. Sewage did not drain into the pond, but the children reported having seen dead cats floating in the water. They ate their sandwiches on the bank, fished and waded in the water. On this day or a few days earlier B7 had actually tried to swim in the pond—the only person his associates had ever seen do so. One friend, RW (contact 22), fell in.

August 22: Tonsils and adenoids were removed by dissection from M6, B7, J8, R9 and E11, in that order. The latter four also had teeth extracted. The operations were performed with aseptic precautions under anesthesia with ether in a private hospital. An interval of approximately twenty minutes between operations was employed for sterilization of instruments; how the mask was treated was not clearly ascertained. The surgeon did not wear gloves but scrubbed thoroughly before each operation. One nurse assisted in operating, two others in the care of the patients.

Except for B7, whose tonsils were difficult to dissect free, the operative procedures went smoothly. After operation the patients were placed in a recovery ward. B7 vomited; none of the others did. After spending the afternoon in the hospital the children were taken home.

August 23: The children remained at home.

August 24: The entire K family called on the related LaP family, consisting of father, mother and two children, M14 and P10, who had been free of any signs of illness. While

there another related family, LaB, father, mother and two children, K7 and D5, came in. The last mentioned children and the mother had experienced some gastrointestinal disturbance about two weeks earlier. The K children were quiet, and the entire visit lasted about one-half hour.

It is of interest to note that the cousin, M14, had her tonsils removed on August 26 by the same operating team and at the same place as the K children. Convalescence was uneventful.

August 25: The children remained at home.

August 26: The children were more active, going in and out of the house. E11, J8 and B7 went with two McH cousins to a nearby wood and played with a group of neighborhood boys. There was a private fish pond with a constant waterflow. They all drank from it.

During the week the K children played with numerous children. On August 26, 29 and 30, J8 and B7 waded in Erie Pond. E11 delivered magazines to various homes, including one in which a 1½ year old child (contact 27) subsequently developed a febrile illness. They did not enjoy food, however, and ate mostly ice cream and liquids.

August 28: The children were all taken to the physician, who examined their throats, considered their condition satisfactory and discharged them.

August 29 and 30: The MaA family visited in Kentucky from August 2 to 16. The oldest girl, L12 (contact 1), visited in Cleveland from August 17 to 24 with relatives, the MaB family, including three cousins (contacts 5, 6 and 7). Across the street from that home a fatal case of poliomyelitis had occurred, but no contact had been made. The week of August 25 to 31, after the return of L12 from Cleveland, all the MaA children (contacts 1, 2, 3 and 4) had severe diarrhea, sufficiently severe to require camphorated tincture of opium U. S. P. for the youngest, F3. From August 28 to September 2 two of the MaB cousins (contacts 5 and 6) visited. From August 28 to 30 the K children, E11, R9 and M6, played with the girls of the Ma families in rehearsing and putting on a play. This included fairly intimate association.

Another girl from the MaB family (contact 11) of Cleveland visited in Akron at the same time with a cousin (contact 8) of another branch of the Ma family (MaC). The latter girl had her tonsils removed in Cleveland on August 25. No ill effects ensued.

In addition, L2½, of the K family, played constantly with F3 (contact 4) of the MaA family. F3 also had coryza and fever on September 5, as well as the attack of diarrhea.

August 31: One of the K children, B7, was listless and refused to eat. The others seemed well. The family went to call on the aunt with whom the older group had stayed in July.

September 1: B7 complained of abdominal pain and vomited. The others played in the neighborhood.

September 2: Mrs. K telephoned the physician, who asked that B7 be taken to his office. Because the patient felt better that evening, it was not done. The other children played normally.

September 3: B7 was worse, with continued vomiting. Mrs. K took E11, R9, J8 and M6 to register for school. J8 felt sick and went to bed. M6 complained of abdominal pain and loss of appetite. Some of their playmates played in the K house.

September 4.: B7 seemed about the same. J8 and M6 were nauseated and vomited. The physician was called and suggested the possibility of poliomyelitis. The three children were put to bed. E11 complained that his "throat felt funny" and had some difficulty in swallowing. B7 and M6 had no fever. J8 and E11 had "slight" fever.

September 5: R9 took sick with abdominal pain, vomiting and pain in the back and left shoulder. E11 had nausea and vomiting. J8, B7 and M6 vomited more.

September 6: B7 could not move his left arm and complained that it felt "creepy." M6 developed dysarthria and dysphagia in the evening. R9 developed dysarthria, dysphagia and high fever. E11 developed aphonia and right facial paralysis and had difficulty in breathing.

September 7: Another physician was called and the five children were admitted to the Akron Children's Hospital with a diagnosis of poliomyelitis. E11 became worse with palatal, cervical and diaphragmatic paralysis. No paralysis of the extremities was detected. Examination of his spinal fluid showed pressure 14 mm. of mercury, 263 cells, 82 per cent of which were polymorphonuclear leukocytes, and protein, 80 mg. per hundred cubic centimeters. R9 showed palatal and right facial paralysis, stiff neck and pain in the left shoulder; there was no paralysis of the extremities. Examination of her spinal fluid showed pressure 14 mm. of mercury, 85 cells, 56 per cent of which were polymorphonuclear leukocytes, and protein, 66 mg. per hundred cubic centimeters. M6 became unconscious with bulbar palsy. Her spinal fluid showed pressure 6 mm. of mercury, 38 cells, of which 30 per cent were polymorphonuclear leukocytes, and globulin a trace. J8 developed dysarthria and dysphagia, palatal paralysis, left facial paralysis and questionable involvement of the right quadriceps. His spinal fluid showed pressure 8 mm. of mercury, 102 cells, of which 36 per cent were polymorphonuclear leukocytes, and a positive globulin reaction. B7 showed dysarthria with paralysis of the left side of the pharynx, left diaphragmatic paralysis and extensive paresis of all four extremities. His spinal fluid showed pressure 6 mm. of mercury, 43 cells, 7 per cent of which were polymorphonuclear leukocytes, and globulin a trace.

September 8: E11 died at 6:30 a. m. R9 died at 3:30 p. m. M6 remained unconscious. B7 was very sick. J8 developed weakness of the right shoulder girdle.

September 9: M6 died at 11:30 a. m. B7 survived after a protracted, stormy course. J8 survived after a severe but less hazardous course.

During this entire period the youngest child, L2½, and the mother and father remained well.

There were numerous other children with whom one or more of the K children played both before and after operation, with house to house visiting and close association. None of these developed symptoms or signs of poliomyelitis. Except for those already mentioned, only two had any illness: one a cold and the other a mild gastrointestinal disturbance of one day's duration, which was attributed to green apples.

VIRUS STUDIES

In an attempt to gain information concerning the possible source of infection, the dissemination of poliomyelitis in the community and familial associates, a collection of stools from 54 persons was made between September 9 and 17. Specimens were obtained in cardboard containers and kept in the frozen state with solidified carbon dioxide until prepared for animal inoculation. Since the major purpose was to identify reservoirs rather than to detail individuals, emphasis was placed on the children's associates. Furthermore, available information indicates that virus may be more readily recovered from the stools of children than from those of older persons.[3]

Stools were prepared variously, by the method of Kramer, Hoskwith and Grossman,[4] by that of McClure using duponol[5] or by simple treatment with ether and centrifugation.[6] From 10 to 15 cc. of the fluid material was injected into the peritoneal cavity of a Macacus rhesus monkey and 2 to 3 cc. given intranasally. If the material was well tolerated the dose was repeated on the third or fourth day and again a few days later. Temperatures were taken twice daily, and the animal was thoroughly exercised each day. The animals were

3. Sabin, A. B., and Ward, Robert: Distribution and Elimination of Virus in Human Poliomyelitis, J. Bact. **41**: 49 (Jan.) 1941. Trask, Paul and Vignec.[6]

4. Kramer, S. D.; Hoskwith, B., and Grossman, L. H.: Detection of the Virus of Poliomyelitis in the Nose and Throat and Gastrointestinal Tract of Human Beings and Monkeys, J. Exper. Med. **69**: 49 (Jan.) 1939.

5. McClure, G. Y.: An Improved Method for Determining the Presence of the Virus of Anterior Poliomyelitis in Stool Specimens, Science **93**: 118 (Jan. 31) 1941.

6. Trask, J. D.; Paul, J. R., and Vignec, A. J.: Poliomyelitic Virus in Human Stools, J. Exper. Med. **71**: 751 (June) 1940.

killed and pathologic sections prepared. In a certain number of animals suggestive signs were noted; passage to other animals was made for confirmation. Animals with fever but without evidence of involvement of the central nervous system were killed, and microscopic sections of the brain and cord were made. Only those were considered positive in which frank paralysis and typical pathologic changes ensued.

Stools were procured from nine related adults and twelve related children, including the mother, father and surviving brother (table 1). The virus was identified in specimens from the well brother, from the two Be cousins from Youngstown, Ohio, and from four of the five McH cousins. None was found in stools of any of the adult relatives.

Negative results were obtained with specimens from the surgeon and the anesthetist and with pooled specimens from the three nurses.

Stool specimens were obtained from twenty-eight playmates under 13 years of age, representing sixteen families, who (with the exception of the three MaB children from Cleveland, contacts 5, 6 and 7) lived within a radius of one block of the K family (table 2). Most of them played frequently with one or more of the K children both before and after operation. Except for contacts 7, 8, 24, 25 and 27, the contact would be considered intimate, visiting in homes was common, and in many instances it was prolonged and repeated. Pools of four, three, three and two specimens, respectively, by families were made to include twelve contacts; the remaining sixteen were tested individually. The only positive result was secured with a pool from the three youngest children of the MaA family. The oldest girl, who had visited in Cleveland, failed to yield virus.

Other materials were obtained as follows:

(*a*) Dust from the mattress on which three of the K children slept, dust from bedrooms of the children and from the carpet sweeper and dust from the parents' room was examined. Each of the three specimens was shaken with a small volume of saline solution, and the fluid was removed and treated by ether and centrifugation for inoculation into monkeys. No virus was demonstrated.

TABLE 1.—*Familial Contacts of the K Children*

Family	Name	Age	Relation	Date of Stool	Result of Monkey Test
K	A	Adult	Father	9/13/41	Negative
				9/16/41	Negative
	M. A.	Adult	Mother	9/13/41	Negative
				9/16/41	Negative
	L	2½	Brother	9/10/41	Positive
Be	R	Adult	Uncle	9/17/41	Toxic
	E	Adult	Aunt	9/17/41	Negative
	W	5	Cousin	9/17/41	Positive
	D	3	Cousin	9/17/41	Positive
Ba	J	Adult	Aunt	9/16/41	Negative
McH	M	12	Cousin	9/13/41	Positive
	G	9	Cousin	9/13/41	Positive
	C	8	Cousin	9/13/41	Positive
	R	7	Cousin	9/13/41	Toxic
	R	6	Cousin	9/13/41	Positive
LaP	E	Adult	Uncle	9/13/41	Pooled; negative
	M. T.	Adult	Aunt	9/13/41	
	P	10	Cousin	9/13/41	
	M	14	Cousin	9/13/41	Negative
LaB	J	Adult	Uncle	9/10/41	Pooled; negative
	F	Adult	Aunt	9/10/41	
	K	7	Cousin	9/10/41	
	D	5	Cousin	9/10/41	

(*b*) Flies (4 Gm.) were collected about the porch and yard of the K home; flies (14.5 Gm.) were also collected about open privies one block away. Each specimen was ground with saline solution to make a 10 per cent suspension, centrifuged and then treated with duponol and ether. The first specimen was given to a monkey of the M. rhesus variety; the second to a Macacus cynomolgus. Neither developed signs of poliomyelitis.

TABLE 2.—*Playmate Contacts of K Children*

No.	Family	Name	Age	Degree of Contact	Date of Stool	Result of Monkey Test
1	MaA	L	12	Intimate	9/10/41	(a) Negative (b) Negative
2		P	10	Intimate	9/10/41	Pool; positive
3		M	8	Intimate	9/10/41	
4		F	3	Intimate	9/10/41	
5	MaB	J	11	Intimate	9/10/41	Pool; negative
6		B	9	Intimate	9/10/41	
7		C	7	Indirect	9/10/41	
8	MaC	M	11	Indirect	9/16/41	
9	R	G	12	Intimate	9/13/41	Negative
10		L	11	Intimate	9/13/41	Negative
11	K	V	11	Intimate	9/13/41	Negative
12	C	A	10	Intimate	9/13/41	Negative
13	Br	T	10	Intimate	9/13/41	Negative
14		R	7	Intimate	9/13/41	Negative
15	Ba	H	..	Intimate	9/13/41	Negative
16	Y	E	11	Intimate	9/13/41	Pool; negative
17		B	7	Intimate	9/13/41	
18	S	P	11	Intimate	9/13/41	Pool; negative
19		M	10	Intimate	9/13/41	
20		J	8	Intimate	9/13/41	
21	H	D	12	Intimate	9/13/41	Negative
22	W	R	6	Intimate	9/13/41	Negative
23	McG	M	8	Intimate	9/13/41	Negative
24	K	B	12	Occasional	9/16/41	Negative
25		D	7	Occasional	9/16/41	Negative
26	I	C	10	Occasional	9/25/41	Negative
27		B	1½	Indirect	9/25/41	Negative
28	G	J	9	Intimate	9/13/41	Negative

(*c*) A sample of 7 liters of water was obtained from Erie Pond. A 2 foot length of sausage casing was suspended in an upright position with a funnel tied into the upper end while the lower end was tied off. The sac was filled with water and exposed continuously to an electric fan. The procedure permits evaporation while retaining a low temperature. In seventy-two hours the total volume was reduced to 170 cc. The residual fluid was removed and treated with ether and duponol. Great difficulty was encountered in ridding the water of bacteria. The inoculated monkey died on the tenth day of bacterial peritonitis without histologic evidence of poliomyelitis.

COMMENT

Our purpose in the present study has been not to emphasize again the presence of poliomyelitis virus in the stools of apparently unaffected persons but to attempt to gain evidence as to the source of infection and the sequence of events which led to the disastrous result in the five children whose tonsils were removed. While the proportion of selected persons (at most 10 of 54) found harboring the virus in their gastrointestinal tracts was relatively small, when placed in perspective by the history the distribution of the positive results assumes considerable significance.

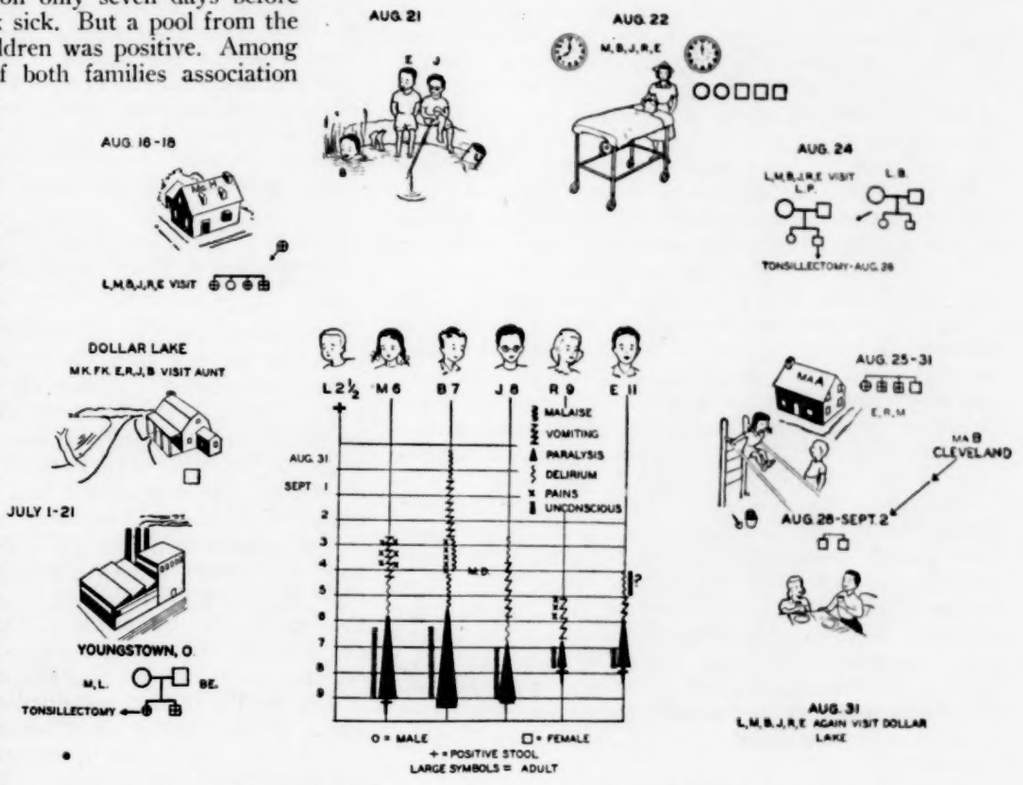
There had been no recognized association with patients with acute poliomyelitis. Nevertheless, the story of the Be cousin of Youngstown, Ohio, with whom the two youngest K children stayed for three weeks in July, is very suggestive. The difficulty experienced by this child two weeks after tonsillectomy readily suggests a mild attack of poliomyelitis. The K and the Be families had no further contact after M6 and L2½ left Youngstown except for a few minutes

two days before operation. The presence of poliomyelitis virus in the stools of the two Be cousins implies a closer relation than mere coincidence between this fact and infection of the visiting K children.

The next family, McH, with whom the K children actually lived was again one in which positive results were obtained. Virus was recovered from the stools of four of five cousins, who exhibited no recognized signs of illness. One of them, M12, had no contact with the K children after their operations. It seems not unreasonable to suggest that the McH family acquired the virus from their K cousins.

Among other associates the occurrence of positive stools was sharply limited to the MaA family, three doors away. It was thought that the oldest MaA child, L12, who had visited in Cleveland, might have served as the source; her stool was negative. Furthermore, she returned to Akron only seven days before the first K child took sick. But a pool from the other three MaA children was positive. Among the older children of both families association was quite intimate immediately preceding the operative procedures. Moreover, the youngest K child, L2½, who was found to harbor virus in his gastrointestinal tract, played constantly with the 3 year old MaA boy and may have served thus to transmit the virus.

The negative results among the remaining twenty-five playmates and other relatives is of interest in view of the fact that many of the former had intimate contact with the K children. It is clear that something more than contact must be invoked to explain the distribution of virus. While the factor of association between the K family and others yielding virus has been emphasized, it is intended to connote a closer intimacy than contact. In the present instance it meant living and eating together with all the related environmental features.



Activities of the K family and distribution of virus among their associates.

The relation of recent tonsillectomy to the development of bulbar poliomyelitis appears to be established.[2] In the present series the sharp limitation of paralytic disease in infected families to those on whom operations were performed clearly indicates that operation was the precipitating factor. This assumption would be translated to the case of the suspected cousin in Youngstown, Ohio. The sixth K child had virus in his stool, was not operated on and failed to show clinical evidence of infection. The remaining infected cousins also escaped. On the other hand, one cousin who was operated on at the same place four days after the K children remained well; virus was not recovered from her stool. An indirect contact, 8, had her tonsils removed in Cleveland during this period. Virus was not isolated, nor did signs of illness occur. Tonsillectomy in an infected community does not seem sufficient. The more likely conclusion is, therefore, that tonsillectomy performed on an infected subject is the provocative factor. This is in agreement with Aycock's conclusion [2] based on a survey of cases and Sabin's conclusion derived from experimental results.[7]

It is of interest in view of experimental studies to consider the duration of the incubation period. It is assumed that incident to the trauma of operation the injured nerves are rendered more susceptible to infection and that the bulbar paralysis is related to direct extension of the virus along the cranial nerves. In fact, Howe and Bodian [8] report certain experimental results indicating that in the first few days following nerve section the susceptibility of the motor cells to poliomyelitis is enhanced. Under such conditions the incubation period might be expected to be shorter than usual, especially since the distance the virus would traverse by axonal progression from pharynx to medulla is relatively short. The fact that the incubation period differs little in such cases from that encountered in the usual spinal type indicates that other factors are involved in determining the speed with which symptoms are induced.

The relative uniformity in the time of onset in the present cases suggests simultaneous infection. The onset of paralysis in the entire group occurred within forty-eight hours. Although the onset of symptoms in

7. Sabin, A. B.: Experimental Poliomyelitis by the Tonsillopharyngeal Route with Special Reference to the Influence of Tonsillectomy on the Development of Bulbar Poliomyelitis, J. A. M. A. **111:** 605 (Aug. 13) 1938.

8. Howe, H. A., and Bodian, David: Neural Mechanisms in Poliomyelitis, New York, Commonwealth Fund, 1942, p. 170.

B7 preceded the others by twenty-two, it may be recalled that his operative trauma was more severe, that he vomited postoperatively and that he complained of more constant pharyngeal discomfort than the others. It is true that B7 had frequented and swum in the filthy water of Erie Pond shortly before operation. On the other hand, contacts who accompanied him were not carriers of virus, and of doubtful significance is the fact that virus was not recovered from the water. There remains the possibility that the children were not all carriers of virus at the time of operation but that it was spread from child to child in the course of the manipulations. In this case M6, who was the first patient and had visited in Youngstown, would serve as the source. The frequency of virus infestation in the other families with positive stools would suggest, however, that a similar distribution had taken place in the K children before operation.

In an attempt to fit the available evidence into a single picture, the following sequence of events seems the most satisfactory: The Be cousin from Youngstown, Ohio, was carrying poliomyelitis virus at the time of his tonsillectomy in the latter part of July and developed a mild clinical attack of the disease. His sister was also infected, was not subjected to operation and escaped. The two youngest K children, M6 and L2½, acquired the virus at that time and served as the source of infection for the remaining children in the K family. The K children furnished the virus to the McH cousins, with whom they stayed for two days in August. The younger MaA playmates were also infected from the K children in the latter part of August, while the older one, who was away until the week before operation, was unaffected. The operations incited invasion of the central nervous system in the five older children who were carrying the virus, while the physiologic equilibrium of the remaining child was undisturbed.

The study emphasizes the dangers of tonsillectomy during the months in which poliomyelitis is prevalent even though cases of the disease have not been recognized in the community. There was no indication that untoward effects might be anticipated in this particular group of children, who were in all probability undergoing an inapparent infection. The fact that other families were similarly infested without obvious harmful effects indicates that tonsillectomy served to transform a mild subclinical infection into a severe, fatal disease.

SUMMARY

Tonsillectomy was performed the same day on five apparently healthy children of the K family. All five developed bulbar poliomyelitis and three died. The sixth and youngest child was not operated on and remained well, although poliomyelitis virus was present in his stool.

Virus was recovered from the stools of two cousins, living in a city 50 miles away, with whom two of the K children had lived a month earlier. One of the cousins had difficulty, suggestive of poliomyelitis, following tonsillectomy. The evidence suggests that the virus was acquired by the K children during the visit.

Four additional cousins in another family group with whom the K children had subsequently lived were found to be carrying the virus without exhibiting any signs of poliomyelitis. They presumably became infected during the visit.

No virus was recovered from nine adult relatives or from cousins of two other family groups with whom contact had been casual.

Among twenty-eight playmates, many of whom had had intimate contact with the affected children, a group of three children in one family was found to be carrying virus.

The results indicate that a closer association than ordinary contact was involved in the transmission of the virus, but no virus was recovered from extrahuman sources.

It is clear that the operative procedure was the factor precipitating the severe bulbar form of poliomyelitis in children who otherwise would probably have escaped with inapparent infections. These observations emphasize again the dangers inherent in tonsillectomy during the season in which poliomyelitis occurs even though it is not notably prevalent in a community.

PRODUCTION OF TETANUS IN GUINEA PIGS

BY SUBCUTANEOUS IMPLANTATION OF PELLETS CONTAMINATED WITH TETANUS SPORES

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The administration of crystalline hormones by the subcutaneous implantation of compressed tablets or pellets, introduced by Deanesly and Parkes,[1] appears now to be an established clinical procedure when a prolonged uninterrupted action is desired. From the work of Deanesly and Parkes[2] and Thorn and his co-workers[3] it is apparent that this method of treatment will be greatly extended.

The implantation into the subcutaneous tissue of a hard compressed pellet accidentally contaminated with Clostridium tetani followed by subsequent healing of the wound sets up practically an ideal focus for the development of tetanus. Fildes[4] and Russell[5] point out that the germination of tetanus spores is dependent chiefly on the oxidation-reduction potential of the tissues. Heated spores alone when injected into guinea pigs do not cause the development of tetanus, while the injection of spores mixed with sterile earth or calcium chloride results in the typical symptoms of this disease. Fildes considers that the oxidation-reduction potential of the normal tissue is sufficiently high to prevent germination of spores and that in areas of necrosis the potential falls to a point sufficiently low to permit their development. When tetanus spores are accidentally introduced into a wound, their germination with subsequent production of toxin depends largely on the presence of certain accessory factors, such as hemorrhage, trauma, certain types of chemicals and

From the Food and Drug Administration.

1. Deanesly, R., and Parkes, A. S.: Factors Influencing the Effectiveness of Administered Hormones, Proc. Roy. Soc. London, s. B. **124**: 279 (Dec. 7) 1937.

2. Deanesly, R., and Parkes, A. S.: Further Experiments on the Administration of Hormones by the Subcutaneous Implantation of Tablets, Lancet **2**: 606 (Sept. 10) 1938.

3. Thorn, G. W.; Engel, L. L., and Eisenberg, Harry: Treatment of Adrenal Insufficiency by Means of Subcutaneous Implants of Pellets of Desoxycorticosterone Acetate, Bull. Johns Hopkins Hosp. **64**: 155 (March) 1939.

4. Fildes, Paul: Tetanus: VI. Conditions Under Which Tetanus Spores Germinate in Vivo, Brit. J. Exper. Path. **8**: 387 (Oct.) 1927.

5. Russell, D. S.: Tetanus: V. The Local Fate of Tetanus Spores Inoculated into Guinea Pigs, Brit. J. Exper. Path. **8**: 377 (Oct.) 1927.

the toxins of other anaerobes, all of which are conducive to the development of a lowered oxidation-reduction potential.

The possibility of the development of tetanus through the introduction of pellets contaminated with tetanus spores may seem remote. However, the conditions necessary for germination of such spores are present, since the pellet constitutes a foreign body, which potentially can act as an accessory factor. Thus the subsequent production of necrotic tissue and lowering of the oxidation-reduction potential will result in tetanus if the pellets implanted, through some unfortunate circumstance, should become contaminated with Cl. tetani.

In the present report pellet implants have been made in a series of over 200 guinea pigs. For purposes of economy, and because its composition was similar to that of certain hormones used in subcutaneous implants, U. S. P. cholesterol was used in the preparation of all pellets. Various concentrations of tetanus spores were incorporated in the pellets, and several antiseptics were used in certain pellets to determine whether they could prevent the development of the disease under the test conditions. These studies were undertaken primarily to determine the safety of such pellets, since it was quite apparent that they would be presented eventually for appraisal under the provisions of the Food, Drug and Cosmetic Act.

METHODS AND RESULTS

In the preparation of the pellets 15 Gm. of cholesterol was dissolved in 100 cc. of U. S. P. ether (for anesthesia) and then filtered through a Seitz filter. Some cholesterol is lost by this procedure. Tests for sterility of this filtrate were made by evaporating it to dryness and adding the residue to chopped meat medium. Under aseptic conditions 1 cc. of the ether solution of cholesterol was placed in a sterile 20 mm. glass shell vial approximately 25 mm. high and evaporated to dryness in a sterile desiccating jar under partial vacuum in a 56 C. incubator. Evaporation was complete usually in ten minutes. After evaporation the residue was carefully scraped from the bottom and sides of the vial with a pliable spatula and placed in a mold [6] and the pellet prepared. Pellets prepared in this manner weighed from 90 to 100 mg. Tetanus spores suspended in distilled water or the antiseptics in appropriate solvents were added to the cholesterol solution just before evaporation.

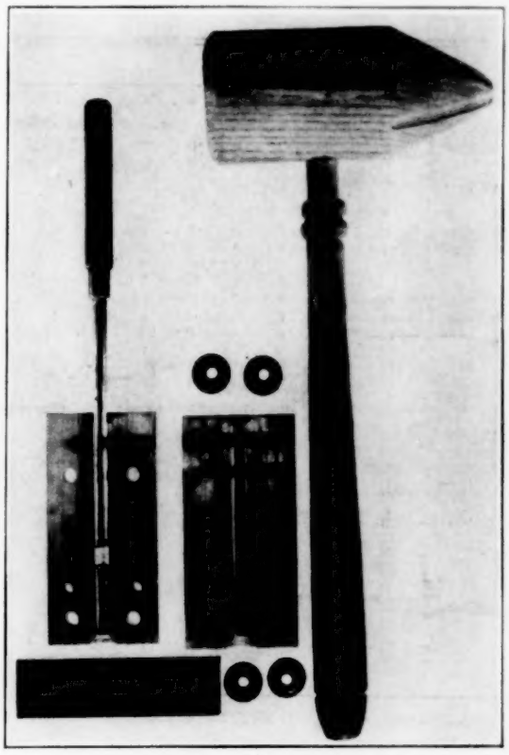
The tetanus spores prepared in chopped meat culture under Vaspar seal were washed free from toxin with distilled water and then heated at 82 C. for twelve minutes to destroy vegetative forms. The spores in the desired concentrations were added to the cholesterol solution suspended in 0.1 cc. of distilled water in all instances.

For implantation of pellets, the hair was removed with electric clippers from an area about 4 cm. in diameter on the right flank of the guinea pig. Under a local anesthetic an incision about 2 cm. long was made through the subcutaneous tissue parallel to the spine anterior to the hip joint. Using blunt hemostatic forceps a subcutaneous pocket was prepared in the natural plane of cleavage between the skin and deeper structures which extended about 3 cm. in the flank of the animal. A pellet was deposited in each pocket with sterile forceps, and skin clips were used to close the opening. The clips were removed usually after forty-eight hours.

6. Instructions for construction of this mold were given us by G. W. Thorn, Johns Hopkins University, Baltimore.

In a preliminary experiment fifteen 90 mg. pellets were prepared under aseptic conditions and ten were implanted in guinea pigs. The remaining five pellets were crushed under aseptic conditions, tested and found to be sterile. The wounds in the ten animals treated healed promptly, and there was no evidence of infection during the time the animals were under observation (two months).

After this preliminary work, pellets containing spores were implanted in a series of 30 guinea pigs, and for comparative purposes implants of gelatin capsules containing equivalent amounts of cholesterol and spores were made in a further group of 30. In each of the groups of 30 animals, 15 received concurrently an inoculation of 0.1 cc. of a twenty-four hour broth culture of Staphylococcus aureus at the site of implantation. The concentrations of spores used were 100,000, 1,000,000 and 100,000,000. The results are shown in table 1.



Unassembled mold for preparation of pellets.

In those animals developing tetanus, paralysis appeared first in the right hind leg (nearest to implanted pellet or capsule) but extended rather rapidly to the spine and other hind leg. The spine invariably arched to the right, and soon after this occurred the animals when placed on their sides could not get back on their feet without help. Usually within one to three days after the first sign of paralysis the animals died.

It will be noted (table 1) that of the 14 guinea pigs treated with pellets containing tetanus spores 3 of the 4 receiving 100,000 spores developed tetanus and died, 2 of the 5 receiving 1,000,000 spores developed tetanus and died, while in the 100,000,000 spore group all 5 developed the disease and died. In the group of 15 animals in which implants of pellets plus tetanus spores were accompanied by inoculation of 0.1 cc. of Staph. aureus at the time of implantation, 13 animals developed the disease and died, 4 in the 100,000 spore group, 4 in the 1,000,000 spore group and 5 in the 100,000,000

spore group. The 2 animals that survived in this group lost their pellets, one on the twelfth and the other on the sixteenth day. During these studies it was noted that some of the pellets broke through the skin of the animals, and this was particularly true in those animals which developed a pus pocket at the site of implantation. The combination of sharp edges on the pellet and softening and breakdown of tissue because of pus formation were conducive to pellet loss. Both the remaining animals in this series were bled from the heart on the twenty-eighth day, and the serums were tested for the presence of tetanus antitoxin. None could be demonstrated.

In table 1 are given also the results of implants made with gelatin capsules containing the same amounts of cholesterol and spores as used in the pellets. It will be noted that all 15 guinea pigs receiving capsules containing cholesterol and 100,000, 1,000,000 or 100,000,000 spores developed tetanus and died within five to ten days. In these groups the capsule appeared to be dissolved completely within twenty-four hours after implants were made. The wounds all healed cleanly within forty-eight hours. Tetanus was first evident on the third day in the 100,000,000 spore group, on the fourth day in the 1,000,000 spore group and on the fifth day in the 100,000 spore group.

In the group of animals in which capsule implants were made and 0.1 cc. of staphylococcus broth culture was injected at the time of closing the wound, an entirely different result was obtained. Pus pockets were observed in all animals, and healing of wounds in those surviving was slow. In all animals considerable of the cholesterol and apparently spores as well were exuded with the pus. In the 100,000 spore group 2 animals died of tetanus within five days, 2 survived but showed no tetanus antitoxin in their blood serum and the fifth, although developing severe paralysis by the seventh day and remaining in this condition for one week, eventually recovered. Small amounts of antitoxin could be demonstrated in this animal's blood serum. In the 1,000,000 spore group 3 animals developed tetanus and died in five days, while the remaining 2 animals developed the disease and died between the forty-first and forty-fifth days. Neither of the latter had demonstrable amounts of tetanus antitoxin in its serum. All animals in the 100,000,000 spore group developed tetanus and died within six days.

As a control on the effect of Staph. aureus, pellet implants were made in an additional 10 guinea pigs. Five of these animals were given sterile pellets but inoculated with 0.1 cc. of a broth culture of staphylococci at the site of implantation. The other 5 were treated with pellets containing 100,000,000 spores and 1 per cent phenyl mercuric acetate and inoculated also with staphylococci at the site of implantation. The phenyl mercuric acetate was added to inhibit the development of the staphylococci. Pus developed at the site of inoculation of all 5 of the first group, while those receiving pellets containing phenyl mercuric acetate showed no evidence of pus formation. One of the animals receiving sterile pellets plus the staphylococcus inoculation lost its pellet on the eleventh day and died on the twenty-second day. All others survived the wounds, eventually healing with elimination of pus. However, although no pus formation was noted in the group of 5 animals in which pellets containing tetanus spores and phenyl mercuric acetate were implanted, all these animals developed tetanus, none surviving beyond the fourteenth day.

In order to determine whether antiseptics would have a delaying effect on the development of tetanus in guinea pigs, pellets containing 100,000,000 tetanus spores and 1, 0.5 and 0.1 per cent concentrations of phenyl mercuric acetate, hexylresorcinol, boric acid and azochloramid, respectively, were prepared and implants made in a group of 65 animals. Five guinea pigs were used for each antiseptic at each concentration level, and 5 served as controls. The last mentioned animals received

TABLE 1.—*Implants Made With Pellets Plus Spores and Capsules*

Number of Spores	Guinea Pig Number	Days Following Implantation																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	60
Pellets Plus Spores Implanted																						
100,000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No tetanus
	2	0	0	0	0	0	0	0	0	SP	†											
	3	0	0	0	0	MP	SP	†														
	4	0	0	0	0	MP	SP	†														
	5	Pellet broken																				
1,000,000	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No tetanus
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No tetanus
	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No tetanus
	9	0	0	0	SP	†																
	10	0	0	†																		
100,000,000	11	0	0	0	0	0	SP	†														
	12	0	0	0	0	SP	†															
	13	0	0	MP	SP	†																
	14	0	0	†																		
	15	0	0	†																		
Capsules Plus Spores Implanted																						
100,000	31	0	0	0	0	0	MP	†														
	32	0	0	0	0	0	SP	†														
	33	0	0	0	0	SP	†															
	34	0	0	0	0	SP	†															
	35	0	0	0	0	†																
1,000,000	36	0	0	0	0	0	0	MP	SP	SP	†											
	37	0	0	0	0	SP	SP	†														
	38	0	0	0	0	SP	SP	†														
	39	0	0	0	0	SP	†															
	40	0	0	0	SP	†																
100,000,000	41	0	0	0	0	SP	SP	†														
	42	0	0	0	SP	†																
	43	0	0	MP	SP	†																
	44	0	0	MP	SP	†																
	45	0	0	MP	SP	†																

SP, severe paralysis. MP, mild paralysis. 0, no symptom of tetanus. †, death from tetanus.

no antiseptic. Each animal was inoculated at the site of implantation with 0.1 cc. of a twenty-four hour broth culture of Staph. aureus just before the incision was closed. The results are given in table 2, where it will be noted that, although not offering protection against tetanus, phenyl mercuric acetate delayed the development of this disease in guinea pigs for several days beyond the time required for tetanus to develop in the animals treated with boric acid, azochloramid or hexylresorcinol or in the control group in which pellets free of antiseptic were utilized.

In the group in which were implanted pellets containing 1 per cent phenyl mercuric acetate, 4 guinea pigs died of tetanus, one on the fourth day, one on the nineteenth day, one on the twenty-first day and one on the thirty-fifth day. Two guinea pigs lost their pellets, one on the twelfth day and one on the fourteenth day. The latter animal gave birth to a normal guinea pig on the thirty-third day following implantation, showed paralysis on the thirty-fourth day and died on the thirty-fifth day. The animal that lost its pellet on the twelfth day did not develop the disease. Those animals receiving pellets containing 0.5 or 0.1 per cent phenyl mercuric acetate developed tetanus and died between the third and seventeenth days. The animals receiving pellets containing 1 per cent boric acid developed tetanus and died by the eleventh day, while those receiving pellets with 0.5 or 0.1 per cent of this compound died of the disease in from three to five days, the same length of time required for the controls. Those animals receiving pellets containing 1, 0.5 or 0.1 per cent concentrations of hexylresorcinol or azochloramid appeared to develop the disease and die even faster than the control animals, which received pellets with no antiseptic incorporated but with the same concentration of spores.

In view of the results obtained with phenyl mercuric acetate, it seemed desirable to repeat tests with this compound. Accordingly, implants were made in 15 guinea pigs with pellets containing 1,000,000 spores and 1, 0.5 and 0.1 per cent of phenyl mercuric acetate, respectively. Three animals which received pellets without antiseptic served as controls, and as a check on the effect of the sulfonamide compounds implants were made in 15 guinea pigs of pellets containing 1,000,000 spores and 1, 0.5 and 0.1 per cent sodium sulfathiazole. All the animals in these groups were inoculated with 0.1 cc. of a twenty-four hour broth culture of Staph. aureus at the time the pellets were implanted. Phenyl mercuric acetate again delayed development of tetanus, while sodium sulfathiazole appeared to have little if any delaying effect. All animals in this series, including the controls, surviving implantation of pellets contaminated with tetanus spores for two months lost their pellets while under study. At each concentration level in the phenyl mercuric acetate group 1 animal developed tetanus and died, while in the sodium sulfathiazole group 4 at the 0.1 per cent, 3 at the 0.5 per cent and 3 at the 1 per cent concentration levels developed the disease and died. These results with sodium sulfathiazole are of interest in connection with the use of sulfonamide dusting powders and indicate the necessity for the sterility of such powders when they are used in deep wounds.

The production of tetanus in guinea pigs through implants of sulfanilamide contaminated with tetanus spores is the subject of another paper.[7]

Following these results, implants were made in a further group of 40 guinea pigs with pellets containing only 10,000 spores. Twenty of the 40 pellets used in this series contained 1 per cent phenyl mercuric acetate. Ten animals in each group of 20 were inoculated with 0.1 cc. of a broth culture of Staph. aureus at the time the pellets were implanted. The results are summarized in table 3. It is apparent that phenyl mercuric acetate was again able to retard development of tetanus in these animals, as compared to the controls which

Plus Spores With and Without Inoculation of Staphylococci

Number of Spores	Guinea Pig Number	Days Following Implantation																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	60
Pellets Plus Spores Implanted—Staphylococci Inoculated																						
100,000	16	0	MP	SP	SP	SP	SP	†														
	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No tetanus
	18	0	0	0	0	MP	MP	MP	MP	MP	SP	SP	†									
	19	0	0	0	SP	†																
	20	0	0	0	SP	†																
1,000,000	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No tetanus
	22	0	MP	MP	SP	†																
	23	0	SP	SP	†																	
	24	0	SP	SP	†																	
	25	0	SP	SP	†																	
100,000,000	26	0	0	0	0	0	MP	†														
	27	0	0	MP	†																	
	28	0	MP	SP	†																	
	29	0	SP	†																		
	30	0	SP	†																		
Capsules Plus Spores Implanted—Staphylococci Inoculated																						
100,000	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No tetanus
	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No tetanus
	48	0	0	0	MP	MP	SP	SP	SP	SP	SP	SP	SP	MP	0	0	0	0	0	0	0	Recovered
	49	0	0	MP	SP	†																
	50	0	0	MP	SP	†																
100,000,000	51	0	0	0	0	0	0	0	0	0	0	0	Tetanus 43d day; died 45th day									
	52	0	0	0	0	0	0	0	0	0	0	0	Tetanus 41st day; died 44th day									
	53	0	MP	SP	SP	†																
	54	0	MP	SP	SP	†																
	55	0	MP	SP	SP	†																
100,000,000	56	0	MP	MP	SP	SP	†															
	57	0	MP	SP	SP	†																
	58	0	MP	SP	SP	†																
	59	0	MP	†																		
	60	0	SP	†																		

7. Welch, Henry; Slocum, G. G., and Herwick, R. P.: Tetanus from Sulfonamide Dusting Powders: Development in Guinea Pigs Treated with Sulfanilamide Powder Contaminated with Washed Tetanus Spores, J. A. M. A., to be published.

had been treated with pellets containing the same number of spores, particularly in those animals inoculated with staphylococci, although the retardation in these experiments does not appear to be as pronounced as in the earlier experiments, in which greater concentrations of spores were used.

develop the disease. Seven animals in the phenyl mercuric acetate group not treated with staphylococci developed tetanus and died by the thirty-sixth day; 1 showed no symptom of tetanus and survived, and 2 died during the experiment, apparently from causes other than tetanus.

TABLE 2.—*Implants Made With Pellets Containing 1,000,000 Spores and Antiseptics—Staphylococcoci Inoculated*

Concentration of Antiseptic	Guinea Pig No.	Days Following Implantation																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22 to 32	33	34	35	60
Phenyl mercuric acetate																											
1.0%	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No tetanus
	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	SP	SP	†	
	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	SP	†					
	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	SP	†							
	80	0	0	MP	†																						
0.5%	81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	SP	†									
	82	0	0	0	0	0	0	0	0	0	0	0	SP	SP	†												
	83	0	0	0	0	0	0	0	0	0	0	SP	SP	†													
	84	0	0	0	0	0	0	0	0	0	SP	SP	†														
	85	0	0	0	0	0	0	MP	MP	MP	†																
0.1%	86	0	0	0	0	0	0	0	SP	†																	
	87	0	0	0	0	0	0	SP	†																		
	88	0	0	0	0	SP	†																				
	89	0	0	0	SP	†																					
	90	0	SP	†																							
Boric acid																											
1.0%	91	0	0	0	0	0	0	0	0	MP	SP	†															
	92	0	0	0	0	0	MP	†																			
	93	0	0	0	0	MP	†																				
	94	0	0	MP	†																						
	95	0	0	MP	†																						
0.5%	96	0	0	0	MP	†																					
	97	0	0	MP	†																						
	98	0	0	SP	†																						
	99	0	SP	†																							
	100	0	SP	†																							
0.1%	101	0	0	0	SP	†																					
	102	0	0	0	†																						
	103	0	SP	†																							
	104	0	SP	†																							
	105	0	SP	†																							
Hexylresorcinol																											
1.0%	106	0	0	MP	†																						
	107	0	SP	†																							
	108	0	SP	†																							
	109	0	SP	†																							
	110	0	SP	†																							
0.5%	111	0	0	SP	†																						
	112	0	SP	†																							
	113	0	SP	†																							
	114	0	SP	†																							
	115	0	SP	†																							
0.1%	116	0	0	SP	SP	†																					
	117	0	SP	†																							
	118	0	SP	†																							
	119	0	SP	†																							
	120	0	SP	†																							
Azochloramid																											
1.0%	121	0	0	SP	†																						
	122	0	SP	†																							
	123	0	SP	†																							
	124	0	SP	†																							
	125	0	SP	†																							
0.5%	126	0	0	SP	†																						
	127	0	0	SP	†																						
	128	0	0	SP	†																						
	129	0	SP	†																							
	130	0	SP	†																							
0.1%	131	0	0	SP	†																						
	132	0	0	SP	†																						
	133	0	SP	†																							
	134	0	SP	†																							
	135	0	SP	†																							
Controls																											
	136	0	0	0	MP	†																					
	137	0	0	MP	†																						
	138	0	0	SP	†																						
	139	0	0	SP	†																						
	140	0	SP	†																							

SP, severe paralysis. MP, mild paralysis. 0, no symptom of tetanus. †, death from tetanus.

Of the 10 guinea pigs in the phenyl mercuric acetate group that were inoculated with staphylococci, only 3 developed tetanus; 2 of these died and 1 recovered. The latter animal lost its pellet on the thirty-second day. One of the remaining guinea pigs in this group died with no evidence of tetanus, while the 6 remaining all lost their pellets by the thirty-sixth day and did not

In the control group of animals (those treated with pellets containing 10,000 spores but no antiseptic) approximately the same results were obtained whether or not staphylococci were inoculated at the time of implantation. Seven of the 10 animals that were not inoculated with staphylococci along with pellet implantation developed tetanus and died, 2 animals survived

and 1 died without any symptom of the disease. Of those guinea pigs treated with staphylococci at the time of implantation, 8 developed tetanus and died, and the remaining 2 succumbed without symptoms of tetanus. Of interest was the fact that whether or not phenyl mercuric acetate was present those animals inoculated with staphylococci showed pus formation. It should be noted, however, that pus was present in the control group (no phenyl mercuric acetate) on the second day, while in the phenyl mercuric acetate group it was not evident until the seventh day. The staphylococci used in this experiment were somewhat more virulent than those used previously in this study.

COMMENT

The implantation of compressed tablets or pellets in the subcutaneous tissue in the treatment of deficiency diseases presents a serious hazard if such substances are accidentally contaminated with tetanus spores. The introduction of a contaminated foreign body into the tissues and subsequent healing of the wound offers an ideal focus for the development of vegetative forms of Cl. tetani and subsequent production of toxin. In this study the pellets used in most instances had rather sharp edges, which of themselves would be conducive to the development of necrosis, and this in turn may lower the oxidation-reduction potential and allow vegetation of spore forms.

In these studies it is apparent that pellets contaminated with tetanus spores implanted in guinea pigs will cause the development of the disease, whether as many as 100,000,000 or as few as 10,000 spores are present in the intact pellet. It should be noted that the spores responsible for development of tetanus in the guinea pigs used in this study were those that were washed from the surface of the pellets as they were bathed by the body fluids. The weight loss of these compressed pellets was extremely small over the two month intervals that the animals were under observation. Computation by most probable numbers of the numbers of spores on the surface of a group of ten pellets at one concentration level showed that the 10,000 spore pellet had from 200 to 300 spores on its surface. Of course, it is not possible to compute accurately the numbers of spores on the surface of a pellet of this type; on the other hand, it is obvious that considerably fewer spores were instrumental in the development of the disease than the total incorporated in the pellet when it was prepared.

When guinea pigs were inoculated with staphylococci at the site of implantation, in most instances more of the animals developed tetanus and in a shorter interval of time than when animals were treated with pellets contaminated only with spores. In some groups this was not the case, but in these it appeared that the formation of large amounts of pus plus the sharp edges of the pellet caused a breakdown of tissue which eventually resulted in the pellet working its way through the skin to the surface with subsequent loss of the pellet.

The use of antiseptics incorporated in the pellets during manufacture to prevent development of tetanus would appear to be a futile procedure. Although there are antiseptics which may inhibit spore vegetation, we know of none that can be depended on to destroy resistant spores. In addition, certain antiseptics have a definite toxic effect on human tissue which of itself would be conducive to the vegetation of spore forms. In these studies, although only a few antiseptic substances were tried, it is obvious that certain of them incorporated in pellets with tetanus spores appeared to stimulate development of tetanus in guinea pigs sooner than in the control animals treated with pellets containing spores without any antiseptic. Phenyl mercuric acetate did delay development of the disease when incorporated in proper concentrations in pellets contaminated with tetanus spores, but this substance could not prevent development of the disease even though the number of spores in the pellet was reduced to 10,000, where the surface concentration of spores varied between 200 and 300.

It is apparent from these studies that pellets to be used for implantation in the body tissues should be sterilized during their preparation by an efficient filtration procedure or other effective process, handled aseptically throughout their manufacture and finally controlled by adequate check on their sterility. The process of implantation should be rigidly aseptic.

TABLE 3.—*Implants Made with Pellets Containing 10,000 Spores With and Without Phenyl Mercuric Acetate and Staphylococci*

Group 1 10,000 Spores 1% Phenyl Mercuric Acetate	Group 2 10,000 Spores 1% Phenyl Mercuric Acetate Staphylococci Inoculated	Group 3 10,000 Spores	Group 4 10,000 Spores Staphylococci Inoculated
10 guinea pigs	10 guinea pigs	10 guinea pigs	10 guinea pigs
7 died of tetanus: 1—10th day 1—11th day 1—16th day 1—20th day 1—27th day 1—34th day 1—36th day 1 survived 2 died of other causes	3 developed tetanus, 1 recovered and 2 died: 1— 9th day 1—19th day 6 lost pellets and survived 1 died of other causes	7 died of tetanus: 1— 8th day 2— 9th day 1—11th day 1—22d day 1—28th day 1—41st day 2 lost pellets and survived 1 died of other causes	8 died of tetanus: 1— 4th day 1— 5th day 1— 6th day 2— 7th day 2—16th day 1—29th day 2 died of other causes

SUMMARY AND CONCLUSIONS

Pellets contaminated with the spores of Cl. tetani and implanted in the tissues of guinea pigs produce tetanus. The concurrent inoculation of staphylococci appears to hasten development of the disease.

The incorporation of antiseptics in such pellets is of no value, since certain ones are conducive to the development of the disease, while others merely delay onset of symptoms.

The sterility of pellets to be used for implantation into body tissues should be assured during manufacture by proper filtration or other procedures and such sterility maintained by rigid aseptic technic.

What Makes a Profession.—If there is such a thing as a profession as a concept distinct from a vocation it must consist in the ideals which its members maintain, the dignity of character which they bring to the performance of their duties, and the austerity of the self-imposed ethical standards. To constitute a true profession there must be ethical traditions so potent as to bring into conformity members whose personal standards of conduct are at a lower level, and to have an elevating and ennobling effect on those members. A profession cannot be created by resolution or become such over night. It requires many years for its development, and they must be years of self denial, years when success by base means is scorned, years when no results bring honor except those free from the taint of unworthy methods.—Shumaker, W. A., editor of *Law Notes*.

A RURAL SHIGA DYSENTERY EPIDEMIC

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The county in which the epidemic discussed in this paper occurred is located in south central Kentucky. It covers an area of 400 square miles and is hilly, the soil being red clay to sandy with limestone rock formation. The total population, according to the 1940 U. S. Census, is 18,566, with 1,372 of this number living in the county seat, located about the center of the county. Approximately eight to nine families per square mile reside in the rural areas. Only about 6 per cent of the total population is Negro, about one third residing just outside the corporate limits of the county seat, while the other two thirds reside in scattered homes throughout the county.

The county seat has a filtered and chlorinated water supply drawn from nearby Russell Creek. Approximately 80 per cent of the homes in the town are connected to a sewage system which carries the sewage through a septic tank before it is discharged into Russell Creek below the intake of the water plant. The rural families get their water supplies from shallow wells, chiefly drilled, or from springs. Facilities for the disposal of excreta, when any are provided, consisted only of privies, the overwhelming majority of which are open.

The annual mortality from diarrhea and enteritis per 10,000 of population in this county during the twenty year period from 1921 through 1940 showed wide fluctuations, as would be expected for a relatively small population. The rate reached 8 per 10,000 in 1923, fell to a low of 2 per 10,000 in 1924 and gradually again rose to 8 per 10,000 in 1929. From 1929 the general trend of the rate was downward to 2 per 10,000 in 1940. In 1941, through September, the rate showed a sudden rise to 8 per 10,000 population.

On the evening of June 11, 1941, a local physician reported to the health officer (J. T. D.) that he had 3 very sick children in one family and thought that they had typhoid. The family was visited immediately by the health officer in company with the physician. On arrival at the home they found that 1 of the children had already died, that a second was in coma and that the third was extremely toxic. All had passed frequent bloody stools. The following morning it was found that another of the 3 sick children had died during the night and that 1 more child in the family had come down with the disease, bringing the total cases in this family to 4, with two deaths. Three other cases of what appeared to be similar illnesses were found in the families of two next door neighbors, bringing the total to 7 cases in this community.

On returning to his office the health officer received word that a child had died in another community about ½ mile from the first. Immediate investigation confirmed the report and revealed that 2 others in the same family were sick. All had passed frequent bloody stools, their illnesses being similar in all respects to the cases in the first community.

Laboratory diagnostic facilities were promptly made available. The procedures used and observations made are discussed in detail in a report by Wheeler and his associates.[1]

Those patients with Shiga dysentery classified as having laboratory confirmation of this infection were (1) patients from whose stools the organism was isolated; (2) those from whose stools the organism was isolated and whose serums, in addition, agglutinated a known Shiga organism and (3) those whose serums agglutinated a known antigen and, in addition, had significant corroborative epidemiologic evidence of the infection.

A total of 38 cases gave such laboratory evidence of the Shiga organism being the etiologic agent. The remaining cases which were considered to be Bacterium shigae infections, are accounted for as indicated in table 1. From this table it will be observed that, in addition to the 38 patients with laboratory established cases, there were 43 who were direct contacts of patients with laboratory proved cases, most of them family contacts and all with onsets within ten days after exposure to a proved case. Those not family contacts were persons who had visited in the homes of patients with proved cases and, accordingly, were considered to have been sufficiently exposed to have become infected. Most of the extrafamilial contacts in this group actually visited and ate in homes where there were proved cases. As indicated in this table, 14 more patients were contacts of persons suffering from dysentery who had, in turn, been in direct contact with proved cases of Shiga dysentery. In other words, these 14 patients were indirect contacts of patients with laboratory established cases. The remaining 22 patients were members of families living next door to or in the immediate vicinity of laboratory established cases, that is, in households located within a few feet to a few hundred yards of households in which there were proved cases, and because of habits of intermingling and sanitary conditions around their homes these patients could logically be assumed to have Shiga dysentery. That is, a total of 117 patients are considered to have Shiga dysentery because the condition

TABLE 1.—*Number and Percentage of Total with Specified Evidence for Diagnosis of Shiga Dysentery*

	Patients	Percentage of Total
1. Patients with laboratory evidence of Shiga dysentery infection	38	32.5
2. Patients who were direct contacts of those with laboratory evidence of Shiga dysentery infection	43	36.7
3. Patients who were indirect contacts of those with laboratory evidence of Shiga dysentery infection through intermediate persons sick at time of contact	14	12.0
4. Patients who were next door neighbors or residing in the immediate vicinity of patients with laboratory evidence of Shiga dysentery infection	22	18.8
	117	100.0

Dr. Caudill is epidemiologist and Dr. Teague assistant epidemiologist of the State Department of Health of Kentucky. Dr. Duncan is the health officer of Adair County, Ky.

1. Ralph E. Wheeler, surgeon (R), C. T. Butterfield, principal bacteriologist, and William E. Burns, assistant bacteriologist, U. S. Public Health Service, Cincinnati.

was either laboratory established or epidemiologically related to laboratory established cases.

With regard to the incubation period of Shiga dysentery in this outbreak, it is noteworthy that in 59 cases presenting a definite intimate exposure with a case of the disease within ten days prior to onset, the average number of days between first exposures and onsets was 5.3 days.

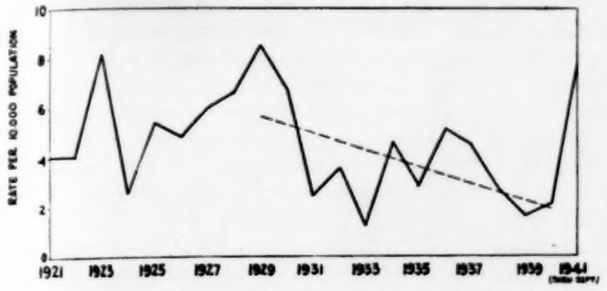

Fig. 1.—Mortality from diarrhea and enteritis per 10,000 of population in Adair County, Ky., from 1921 through September 1941, showing trend from 1929 through 1940.

As indicated in figure 2, it was found that the modal day of onset, when arranged according to the day of onset after first exposure, was the fourth day, with the fifth and sixth days after first exposure being the next most frequent days of onset. Onsets on the fourth day were numerous in cases in which there were family contacts.

The unusual severity of the dysentery immediately stimulated reporting throughout the county. Accordingly, a total of 224 cases of diarrheal disease were reported to the local health department during June, July, August and September. All these cases were investigated. Of the total, 117 cases were diagnosed as Shiga dysentery; the remainder were diagnosed as other types of dysentery—Flexner, Sonne and Hiss-Y making up those in which laboratory procedure demonstrated the presence of an organism of the Shigella group.

The 117 cases of Shiga dysentery were largely in families grouped in three distinct communities. Two of these communities were just beyond the northern corporate limits of the county seat, many of the men in both being employed at a lumber mill located in one of them. The third was 8 miles west of the county seat in and about a rural hamlet with a population of approximately 50. Only white families resided in these three epidemic areas. It was relatively easy to explain the spread in each of the three areas. As indicated in figures 3 and 4, in each of the three areas there were laboratory established cases of Shiga dysentery.

Apart from the two epidemic areas on the northern outskirts of the county seat, cases occurred in several families scattered in and around the town. Three of these families lived between the two epidemic areas and four others across town on the outskirts of the southwest corner of the city. Of the latter four scattered affected white families, three were in a small community in which resided four white and eight Negro families. In the Negro families, with one exception, the members were all adults, mostly above 60 years of age. In the one family were 2 small children. This family, however, had a home that was well screened and far above the average in cleanliness. On direct inquiry it was ascertained that there was practically no visiting between the Negro and white families. May it not be that the lack of visiting between the white and Negro families and the absence of small children in the Negro families living nearby affected white families were the chief controlling factors in preventing spread of the disease to the Negro families?

The physical and sanitary characteristics of the two distinct epidemic communities on the outskirts of the county seat were quite similar. The houses were small frame or box structures of from two to four rooms, most of them in bad repair, badly kept and occupied by families who, with very few exceptions, were underprivileged and lacked facilities for even elementary cleanliness. The homes were located, for the most part, next door to each other, on contiguous lots facing streets or roads. In the rural hamlet 8 miles west of town the homes, although similar in type to those in the affected communities near town, were mostly located on adjacent small farms rather than on adjacent lots. The attacked homes in all three communities either had no privies or had open back pitless privies or what had once been sanitary privies. Of the sanitary pit privies, all but one were in poor repair, with soiled floors and seats, and many of the pits were full to overflowing with excreta. With one exception, screens on the homes in all three communities were either absent, incomplete or ineffective. Flies were abundant in each of the communities; in fact, according to residents, unusually prevalent. Flies were plentiful inside all the homes except one, and, according to the mother in this home, this was accomplished by constant fanning them out and a continuous killing campaign inside the house.

All the attacked families but two obtained their water supplies from shallow drilled wells or springs. Only two attacked families lived inside the town and used city water. Because of the close proximity of

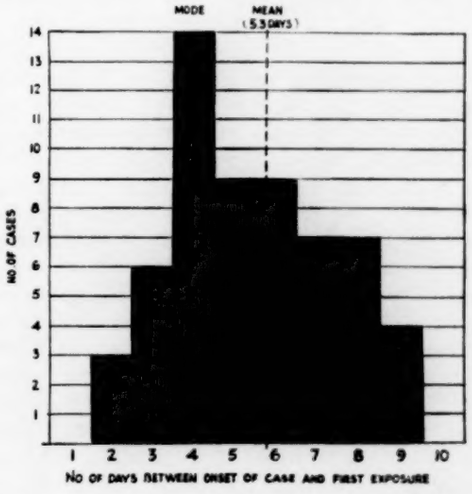

Fig. 2.—The modal and mean incubation period in 59 cases in which there had been definite previous exposure with a case of Shiga dysentery.

the homes in the two attacked communities near the county seat, the families had much in common. Many of the families were related to one another, either by blood or through marriage, thus accounting for frequent interfamily visits. Nor was such visiting limited to blood relatives, visiting and "settin' up" with the sick being a common custom among neighbors.

With regard to cleanliness, excreta were present on porches, around outhouses, in open privy vaults and

on diapers. All this was accessible to flies, as were water and milk buckets, milk bottles, nipples, artificial and natural, and the bread and molasses on kitchen tables. Flies must have made the excreta of one household a common commodity in all households.

Contrasted with the two affected communities adjacent to the county seat was the epidemic area

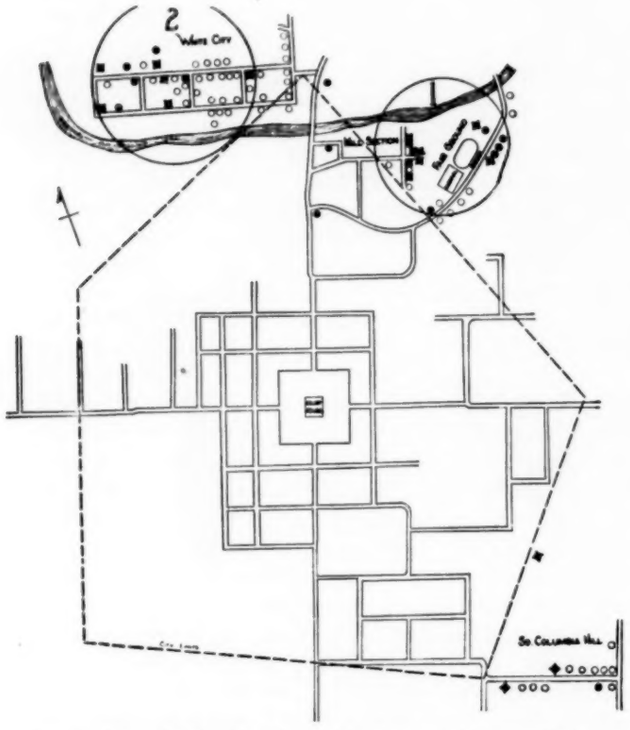

Fig. 3.—Map of Columbia, Ky., Adair County, with a population of 1,372. Black circles indicate attacked homes; black squares, cases of laboratory proved Shiga dysentery; white circles, nonattacked homes.

in the rural hamlet 8 miles away. Here, although the situation with regard to the condition of the houses, excreta disposal, flies, screening and water supplies were essentially the same as in other communities, the distances between homes lessened visiting and intermingling as well as rapid interchange of flies. Still, most of the attacked families in this community were related by blood or marriage. Intermingling among these families was less because of distances between homes and because of the lack of family transportation facilities. However, according to custom, visits were made between families in time of illness, particularly related families, in spite of inconvenience or distance. Thus significant direct exposure could be more often established, making direct contact the chief factor in the spread of the disease in this community.

Contact through visiting and intermingling was considered one factor of importance in the spread of the disease, with the lack of sanitation in and around homes another. As a means of further emphasizing the importance of these factors, a sanitary study of an equal number of attacked and nonattacked homes was made. Two trained sanitary inspectors working together surveyed both the attacked and the nonattacked homes. The nonattacked homes selected for the purpose of this study were located as near as possible to corresponding attacked ones except that none were chosen which had the same water supply. These control households were in the same vicinity as the attacked households, that is on the next farm, within the next block or often next door. In comparing these two groups it was found that the sex distribution in the two was not different from that of the general population, but the number of children in the families constituting the two groups was significantly different, there being fewer children under 15 years of age in the control group than in the attacked group. This difference in the number of children in the two groups was obvious to the most casual observer. As there were fewer children, particularly children under 10 years of age, in control families, it is safe to assume that this is an important reason why the control families were not attacked.

It will be observed further from figure 6 that there was little difference between the two groups of households so far as concerns the pollution of water supplies as determined by bacteriologic examination. However, in contrasting the two groups with regard to excreta disposal, screens, fly prevalence inside and out, housekeeping and personal cleanliness, it was found that the control homes were much superior to the attacked homes. Thus in the attacked homes more children were living in a dirtier environment, with water being an equal hazard to the two.

This of itself would tend to rule out water as a factor in the spread of the disease. However, as further evidence that water was not a significant factor, it is to be noted that in the total of fifty-nine attacked households, their respective water supplies came from forty-nine different and more or less widely separated sources. It is very unlikely that the Bacterium shigae would

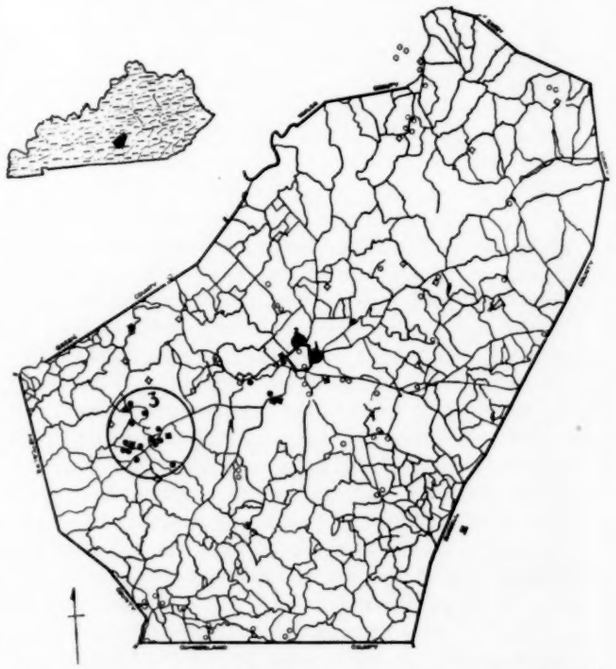

Fig. 4.—Map of Adair County, Ky., with a population of 18,566. Attacked homes are shown by black squares, indicating cases of laboratory proved Shiga dysentery; black circles, epidemiologically Shiga dysentery; white squares, laboratory proved other bacillary dysentery; white circles, epidemiologically other bacillary dysentery.

have found its way into all these different sources within the relatively short period during which cases occurred.

Of the fifty-nine attacked families, eleven used no milk at all; the remaining forty-eight families who used milk regularly or occasionally obtained their sup-

plies from thirty-eight different sources, most of them from their own family cows and some from the family cows of neighbors. Very few of the infected families ever bought milk from a commercial dairy; the few who did occasionally or regularly buy dairy milk patronized no one dairy in particular.

Among the affected families fruits and vegetables taken raw came, for the most part, from family gardens. Commodities bought from stores were obtained from establishments so widely distributed around the county seat and in the affected neighborhoods as to make it entirely unlikely that the infection could have arisen from this source. Ice cream could not have been a factor, because it was a food rarely purchased and eaten by members of any of the families attacked.

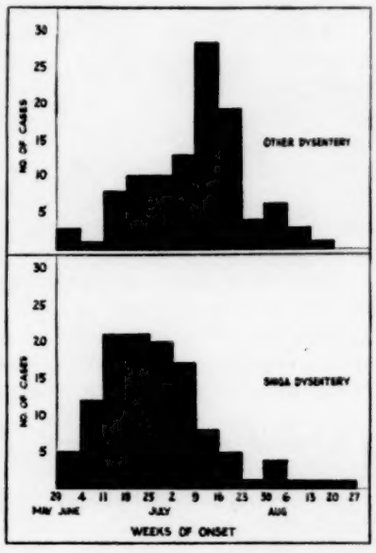

Fig. 5.—Onsets of Shiga dysentery and other types of dysentery in Adair County, Ky., by seven day periods, Thursday throughout Wednesday, during June, July and August 1941.

The only thing in common between the first case that occurred in each of the two epidemic areas on the outskirts of the county seat was more or less continuous attendance at a carnival. The carnival, which had been attended by the first 2 patients prior to their onset of illness, had located within the area of the first epidemic community (fig. 3) on May 25, five days before the onset of the first case.

On a lot immediately adjacent to the one on which the carnival had set up was encamped a band of gypsies. This band of gypsies was not a part of the carnival but pitched camp adjacent to it in order to take advantage of the crowd that would be drawn by the carnival. The clothes of a part of this band of gypsies were washed in the home, by the mother, of the first patient to have dysentery. Further, the first patient had, from the time the gypsies located, played around the gypsies' camp and had carried water for them. Approximately ten days before this gypsy band located at this place 2 children of a young gypsy mother in the band had been ill with what the informant thought was dysentery. One of the 2 children, an infant, had died; the older, a 3 year old child, recovered. Among the clothes washed by the mother of the boy who first became ill were those of this recovered child. The gypsies, while encamped near the county seat, used an insanitary pit privy that had been built on the adjacent county fairgrounds. There was ample evidence that they had also used for defecation a shed located near where they had set up. Flies were in abundance around the carnival and gypsy camp while they were located there, and little effort was made to protect food sold to the public at the carnival from these flies. The gypsies broke camp and headed east on May 30, the date of onset of the first case. With and as a part of the carnival were also some gypsies who had, on several occasions, talked with the mother and grandmother of the 2 gypsy children who had been sick, one of whom had died. It was from these informants that the history of the illnesses of the gypsy children was obtained. It was not until thirteen days after the gypsies had left the county that the disease was first recognized in the community. The gypsies had then had sufficient time to migrate a considerable distance away. It was not possible to get the names of the gypsies from the informants. A number of gypsy bands were interrogated throughout eastern Kentucky after the epidemic was discovered, but none admitted having stopped in the county.

From the onset of the first case on May 30 a total of 117 cases of Shiga dysentery occurred through June, July and the first three weeks of August, with the last onset recorded on August 21. Study of cases by day of onset showed no preponderance of onset on any one day of the week. When the total period over which the epidemic occurred is divided into seven day periods, Thursday through Wednesday, it is found that the incidence of the disease went up rather rapidly in the first two seven day periods, reaching a maximum during the third seven day period and maintaining a plateau over the third, fourth, fifth and sixth seven day periods. During the seventh week, onsets showed a sudden drop, which continued through the eighth week. During the successive five weeks only an occasional onset was recorded. The sequence of onsets is represented in figure 5.

From figure 5 it will be seen that the onsets of other types of dysentery in the county, when arranged by similar seven day periods, showed a gradual rise from the seven day period beginning May 29 through six successive seven day periods, reaching a sharp peak during the seventh week, then falling off rapidly through the succeeding six weeks. The peak week of onsets in the other types of dysentery was two weeks later than the second of the two peak weeks of onsets among the Shiga cases. This would suggest that the disease was introduced into the community and that the epidemic was superimposed on what probably was an ordinary prevalence of other types of dysentery.

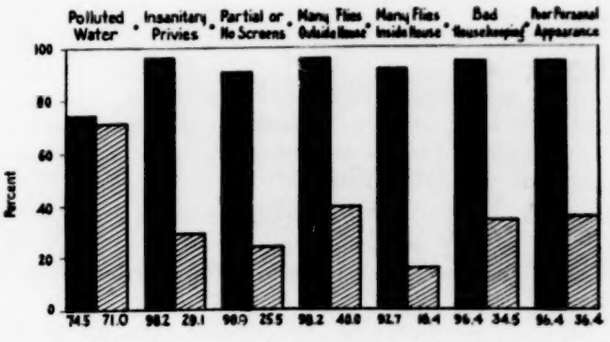
Polluted Water
Insanitary Privies
Partial or No Screens
Many Flies Outside House
Many Flies Inside House
Bad Housekeeping
Poor Personal Appearance
Percent
74.5 71.0 98.2 29.1 90.9 25.5 98.2 40.0 92.7 18.4 96.4 34.5 96.4 36.4

Fig. 6.—Comparison of insanitary factors found in fifty-five attacked homes (black columns) with fifty-five nonattacked homes (shaded columns) in epidemic area.

As indicated in table 2, in the family circles exposed to primary cases 20.7 per cent were attacked. The number of cases was too small, when distributed according to age and sex, to show statistically significant differences between the various categories, but it will be observed that the higher rates were among males in the lower age groups. This is in general agreement with

other observations that have been made in the study of epidemics of bacillary dysentery.

Furthermore, among the total of 117 patients, 72 were males and 45 were females. Assuming that the exposed population was composed of equal numbers of the two sexes, this difference is far beyond what would be expected on the basis of chance variation, the probability being about 100 to 1 against such an occurrence.

Twelve of the 117 cases resulted in death, giving a gross fatality rate of 10.3 per cent. Among the 72 male cases were nine deaths, giving a fatality rate of 12.5 per cent; among the 45 female cases were three deaths, giving a fatality rate of 6.6 per cent. By age, ten of the deaths occurred in the group under 10 years. Eight were boys out of the 33 boys in that age group, giving a fatality rate of 24.2 per cent. The 2 girls under 10 years of age who died were among 19 girls in that age group, giving a fatality rate of 10.5 per cent. Of the 2 persons over 55 years of age who died, 1 was a man (there were 4 men in this age group) and the other was a woman—the only woman over 55 who contracted the disease. All of the deaths occurred at the two extremes of life.

TABLE 2.—*Secondary Attack Rate Based on Total Population in Attacked Families Less Primary Cases, by Sex and by Age Groups*

Age Groups	Total			Male			Female		
	Population Less Primary Cases	Secondary Cases	Secondary Case Rate	Population Less Primary Cases	Secondary Cases	Secondary Case Rate	Population Less Primary Cases	Secondary Cases	Secondary Case Rate
0-9	82	23	28.0	40	14	35.0	42	9	21.4
10-19	75	15	20.0	40	11	27.5	35	4	11.4
20+	114	18	15.8	52	9	17.3	62	9	14.5
Totals	271	56	20.7	132	34	26.7	139	22	15.8

Hence, the attack rate was higher among males. The fatality rate was greater among males. These differences, both attack and fatality, while not assuming wholly reliable statistical significance because of small numbers, collectively must have some significance. At least the difference suggests that males are more frequently infected or are more susceptible, one or both. Any definite answers to these questions, however, must await further study, both epidemiologically and immunologically.

CONCLUSIONS

1. Bacillary dysentery caused by Bacterium shigae was epidemic in a county in southern Kentucky during June, July and August 1941.

2. The infection was probably introduced by a band of gypsies.

3. The disease was superimposed on dysentery caused by other types of Bacterium dysenteriae.

4. After introduction, the disease was spread by (*a*) direct contact and (*b*) lack of environmental cleanliness.

5. The disease attacked males more frequently than females.

6. By age, the highest attack rate was in children under 10 and in males under 10.

7. The gross fatality rate was 10.3 per cent.

8. The disease was most fatal in children under 10, males under 10 and persons over 55.

INDUSTRIAL ILLNESS DUE TO TETRYL

REPORT OF 1,258 CASES

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AND
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Tetryl, or trinitrophenylmethylnitramine, was first described by Romburgh in 1883. Tetryl is similar to trinitrotoluene (TNT) in explosive power and is used as a military propellant. The production of tetryl in quantity dates with the first world war, when it was discovered to be the most efficient initiator of explosives. Tetryl possesses the advantage that the raw materials needed for its manufacture do not deplete the materials required for the manufacture of other explosives.[1]

Tetryl is blended with either graphite or stearic acid as the binding element so that it can be pressed into pellets, the form in which it is most frequently used in munitions. Our experience has been with crystalline tetryl blended with stearic acid.

In the first world war the occupational hazards of tetryl were not fully appreciated in this country because medical investigation could not keep pace with the stress of emergency production. With the termination of the war, tetryl production in quantity ceased and much of the medical investigation that had been initiated was abandoned. At the start of the second world war, improved technical procedures allowed the production of a constant quality tetryl. The use of great quantities of tetryl has introduced a new occupational hazard and has created a challenge to industrial medicine.

A knowledge of the varied symptoms of tetryl illness is becoming increasingly important to the medical profession. This is of concern to private physicians in defense areas as well as the industrial surgeons stationed at shell loading plants. Despite constant observation, a number of employees, in the absence of the typical dermatitis, will visit their family physician complaining of vague systemic symptoms. A short history will direct the examining physician's attention to the etiologic factor.

Past literature indicates the common belief that tetryl toxicity consists essentially of local manifestations.[2] We are not in full agreement with this thought. Since the local symptoms are by far the most commonly encountered, they shall be described first. Employees handling tetryl powder often develop a yellow staining of the hands, which is then frequently carried to the face and hair. In industry the terms "canary" and "tetryl blond" are frequently used to describe this yellow staining of hair, scalp and face. This staining or discoloration is not indicative of tetryl illness or dermatitis. The true pathologic tetryl dermatitis is the most common symptom of tetryl illness. In a study of 1,258 workers affected by tetryl the presenting symptom in 944 of them was a dermatitis. Tetryl dermatitis most commonly occurs on the face, particularly in the circumocular region, on the lateral surfaces of the neck and less frequently in the antecubital fossae and on the dorsal portions of the forearms. The dermatitis generally occurs between the second and third week of exposure,

1. Bain, C. J.: Army Ordnance VI, No. 36, 1926.
2. Smith, E.: Brit. M. J. **1**: 618, 1916. Cripps, L.: Brit. J. Dermat. **29**: 3, 1917. Ruxton.[3]

and the first subjective complaint is that of itching and burning of the affected parts. The dermatitis appears as an erythematous area associated with varying amounts of edema. This condition is most pronounced in the circumocular region and is characteristic. Closer examination discloses a glistening, shiny appearance of the epidermis. In its milder form the dermatitis is not unlike a second degree sunburn, and with progression in the more severe forms there are drying and desquamation of the epidermis which may lead to areas of serous exudation (fig. 1).

Epistaxis is a common and early complaint, occurring most frequently in the early waking hours. On examination, the bleeding points could be traced to small ulcerations of the nasal mucous membrane, in many cases in that area anterior to the inferior turbinate.

Frequent complaints are sneezing, coughing without production and pain in the chest. These symptoms generally occur during the first two weeks of exposure and are the frequent forerunner of tetryl dermatitis. Anorexia, mild nausea, flatulence and abdominal cramping are also common complaints and occur in 10 per cent of all exposed workers. Most frequently epistaxis and dermatitis occur together.

anemia of a rather pronounced degree is becoming increasingly apparent. Other symptoms suggestive of systemic illness, such as headache, irritability, malaise, lassitude and sleeplessness, are frequent complaints. Irregularity of menstruation is frequently observed in cases of tetryl illness. This we cannot attribute to a purely local action.

Of the 1,258 cases surveyed in this study, 3 have been sufficiently severe to require hospitalization. This small percentage emphasizes the importance of prompt medical care with the presenting symptoms. In all 3 instances the history revealed a previous attack of severe tetryl dermatitis which cleared slowly when the employees were removed from contact. After the subsidence of symptoms 2 of these people were accidentally reexposed to tetryl, and a severe reaction promptly recurred. This has created a standing rule at this plant that persons with unusually severe tetryl dermatitis are removed permanently from tetryl exposure.

REPORT OF A TYPICAL CASE

Miss A. H., aged 24, who had worked as a tetryl operator for three weeks, first reported to the Central Medical Unit on April 7, 1942, complaining of recurrent nosebleeds and a rather severe dermatitis involving the circumocular region,

Fig. 1.—Severe form of tetryl reaction, showing drying and desquamation of the epidermis leading to areas of serous exudation.

All these manifestations are believed to be due to direct local contact of tetryl powder on skin or mucous membranes. Tetryl, like trinitrotoluene, is fat soluble and consequently is thought to have a predilection for those areas of skin most heavily invested with sebaceous glands.

The exact reasons why tetryl causes these symptoms are not definitely known. There are two theories most often mentioned: direct mechanical and chemical. Examined under the microscope, tetryl seems to be composed of finely divided crystals liable to fracture, the broken ends being sharp. These physical characteristics of tetryl powder were believed to be the mechanical cause of the manifestations described. The chemical theory is based on a possible oxidizing reaction of tetryl on the skin. The greater probability that tetryl illness is caused by general or local sensitization to tetryl deserves more serious thought.

At the present time, as mentioned previously, tetryl is believed by many to cause only local manifestations. We have found increasing evidence to point toward the probability that the problem is not as simple as it appears. Systemic changes are believed to be quite possible.[3] In our preliminary laboratory data secondary

3. Noro, Leo: Acta med. Scandinav., supp. 120, p. 1, 1941.

the volar surfaces of the forearms and the antecubital fossae. Because of the severity of her reaction it was decided to remove her permanently from tetryl contact. She was given the usual treatment of calamine lotion and mild saline purgatives. She continued to progress favorably, and the dermatitis subsided spontaneously. On April 13 she was accidentally reexposed to tetryl dust when she entered a change house station which was filled with tetryl operators in powder suits. She again reported to the Central Medical Unit, this time exhibiting severe edema in the circumocular region and a dermatitis of the volar surfaces of the forearms. Because of the severe itching and intense burning she was hospitalized for study and symptomatic treatment.

On entrance, examination of the urine was negative for sugar and albumin; the specific gravity was 1.010, and the results of microscopic examination were unremarkable. The red blood cell count was 4,020,000 and the white blood cell count 13,100, with a differential count of 75 per cent neutrophils, 17 per cent lymphocytes, 2 per cent monocytes, 4 per cent juvenile forms, 1 per cent basophils and 1 per cent eosinophils. The hemoglobin content of the blood was 81 per cent. Chemical examination of the blood revealed nonprotein nitrogen 26 mg., sugar 79 mg., chlorides 484 mg. and calcium 10.87 mg. per hundred cubic centimeters. The icteric index was 4.2.

She remained in the hospital for nine days, at the end of which time the temperature, pulse and respiration were normal. Subsequent laboratory work revealed no change in the chemical

constituents of the blood, but there was a slowly developing anemia, as shown by 3,100,000 red blood cells, 5,200 white blood cells and 68 per cent hemoglobin. This anemia responded promptly to ferrous sulfate medication.

This case is of interest because it again emphasizes the fact that when an operator exhibits signs of a severe tetryl reaction he is best removed from tetryl contact permanently. Employees with the milder forms may be allowed to return to their original positions if they are under constant medical inspection. It also emphasizes the possibilities of an increasing sensitization to tetryl in cases of originally severe reactions and raises the question as to the cause of the secondary anemia.

This apparent increase in sensitization has discouraged the routine procedure of skin testing potential operators.

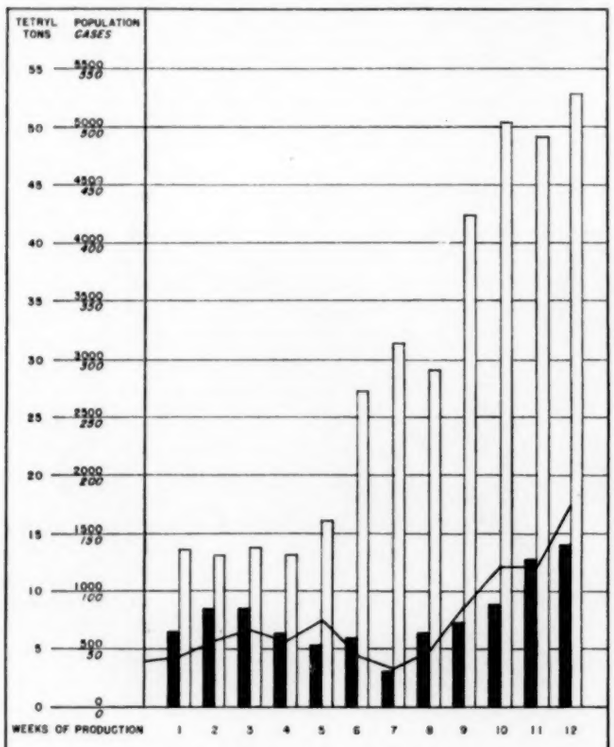

Fig. 2.—There are two factors having an apparent correlation with the weekly incidence of new cases of tetryl reactions: the amount of tetryl used and the increase in exposed population.

It is now generally believed that patch testing possibly serves as a means of sensitizing and consequently might prove to be more dangerous than beneficial.[4]

STATISTICAL STUDIES

Out of a total population of more than 5,000 people working in buildings where tetryl is processed, we have found that 1,258 (23 per cent) have suffered from symptoms of tetryl illness. Of these 1,258, 75 per cent developed a definite tetryl dermatitis. We found in detailed statistical studies of more than a thousand cases that neither age nor sex could be considered definite predisposing factors to tetryl illness.

Forty per cent of operators in direct manual contact with tetryl develop some evidence of tetryl illness. Ruxton,[5] in studying contact operators, found that 32 per cent of workers could be affected. Twenty per cent of operators working in the same building but not in direct manual contact with tetryl develop tetryl illness. This fact definitely proves that we are not concerned alone with direct contact.

The great demands of the country's war efforts interest the industrial surgeons because it is graphically shown that the number of new cases of tetryl illness is usually proportionate to the amount of tetryl used in production within a particular tetryl unit.

Employees usually experience the first symptoms of tetryl illness during their second or third week of exposure.[6] This figure approximates 1 per cent of the entire line population. During the following weeks there is a gradual increase in the percentage of new tetryl cases until the maximum is attained, at the fifth or sixth week, which approximates 5 per cent. From the sixth week on the percentage of new cases gradually recedes to a maintained average of 3 per cent. These percentages suggest the development of an apparent tolerance. It is this working group, which has been exposed to tetryl dust exceeding six weeks, which we expect to be the working population of tetryl lines.

PROPHYLACTIC MEASURES

All measures directed toward the prevention of tetryl illness should be primarily concerned with the control of tetryl dust.[6] At this plant we have processed crystalline tetryl blended with stearic acid. We have reason to believe that granular tetryl with graphite blend may be a big factor in reducing the amount of tetryl dust. Our figures show that operators need not be in direct manual contact with tetryl to suffer from its ill effects. Among our many cases of tetryl illness we have had repeated instances that emphasize the importance of reducing tetryl dust in the production buildings to a minimum. We have had the importance of tetryl dust accentuated by the development of a typical moderately severe tetryl dermatitis in a nurse who worked in a first aid station isolated from any tetryl building. The only etiologic factor could have been a dust contact from employees who worked with tetryl. The mother of one of our employees visiting in his home for a few days developed a typical tetryl dermatitis.

1. *Rotation of Employees.*—Since we have seen that tetryl illness most frequently occurs between the second and third week of exposure, we suggest the weekly rotation of workers in direct manual contact.[5]

2. *Assignment of Open Operations to Rooms of Small Capacity.*—It is advantageous that certain tetryl operations should be carried on in small accessory rooms rather than in large rooms housing many employees. This will reduce the amount of tetryl dust in the entire unit. These operational procedures, for example, would be the placing of tetryl pellets into booster cups, hand drilling, reconsolidation, and so on.

3. *General Cleanliness of Employees.*—The use of powder uniforms which adequately clothe the extremities and includes a cap will do much to avoid unnecessary contact. These uniforms should be particularly chosen to avoid restrictive cuffs about the ankles or wrists which could lead to undue friction. The daily laundering of these uniforms should be mandatory. Provision of adequate shower facilities for employees, particularly those in direct contact, is worth while. The value of the shower following the working period should not be left to the employees' discretion.

4. Schwartz, Louis: Personal communication to the authors, 1941.
5. Ruxton, W. L.: Brit. J. Dermat. **29**: 18, 1917.
6. Silver, A. L. L.: J. Roy. Army M. Corps **71**: 87 (Aug.) 1938.

4. *Ventilation and Temperature Control.*—Forced direct circulating air currents should be eliminated to prevent the dispersion of tetryl dust. Many cases can be traced directly to negligence of this problem. The temperature should be maintained at a 72 F. maximum.

5. *Dietary Measures.*—Little has been said in past reports on dietary measures for the prophylaxis of tetryl illness. Other writers have suggested that the use of milk in quantities of 2 pint portions during the eight hour working period may be used as a prophylactic measure against tetryl illness.[3] We have been unable to find as yet any specific or definite reason why milk would protect one against tetryl illness in any of its manifestations. It might serve some mechanical purpose in reducing gastrointestinal complaints, but we have failed to substantiate this. Workers suffering from symptoms of gastritis have been instructed to eat an adequate meal prior to their working period. This has given good results.

At the present time there are many suggestions as to the value of concentrated vitamin C to employees on production lines of both tetryl and trinitrotoluene. We do not believe there is sufficient evidence to warrant dispensing this drug to such workers.

6. *Protective Skin Cream.*—A protective skin cream was used in an experimental group to study the efficiency of such preventive measures.[4] This cream is composed of 10 per cent zinc oxide and 1 to 2 per cent ferric oxide in a water miscible casein base. The face and neck cream is colored with brown ferric oxide to give a light tan color, and the hand cream contains red ferric oxide. This makes possible rapid inspection on the lines to verify its use. The protective cream is applied to the hands, face and neck before the start of the work period and after the lunch recess. The operators are cautioned to remove the protective cream before lunch and after work by thorough rinsing under cool water.

Results of Controlled Experiment with Protective Skin Cream

Treatment	Group A (Eight Weeks)		Group B (Seven Weeks)	
	No. of Workers	Incidence Weekly	No. of Workers	Incidence Weekly
Hand cream	30	1.2%	45	0.9%
Hand and face cream	30	1.7%	25	1.1%
Untreated controls	40	3.6%	45	4.0%

For the purpose of controlled experiments, the cream was used in two groups of operators working in separate buildings. Each group was divided into three sections. Section 1 was given hand cream only. Section 2 was given hand and face cream. Section 3 was untreated for control purposes. The results are given in the accompanying table.

There was a decrease of approximately 50 per cent in the weekly incidence of tetryl dermatitis when the protective cream was used.[7]

ACTIVE TREATMENT

The certain treatment of tetryl illness is, of course, removal from contact. This is often neither practical nor entirely advisable. In most cases of mild gastrointestinal complaints or mild dermatitis an attempt is made to keep the employees working under conditions of moderate exposure.[8] As many as 60 per cent of these employees develop an apparent tolerance, and a working population is thereby established. We strongly advise that those who in their primary illness develop a severe reaction are permanently transferred from any contact with tetryl. The treatment of the dermatitis consists in the application of calamine lotion without phenol,[9] and in cases in which there is some desquamation the use of moist aluminum acetate dressings is still the honored remedy. Burning of the nasal mucosa is most relieved by the intranasal application of zinc oxide ointment, and our workers are frequently given small amounts for intranasal insertion prior to their working day. We wish to reemphasize the possibility of a secondary anemia in employees who have persistent complaints. This anemia is quickly remedied by the removal from contact with tetryl and the administration of ferrous sulfate. Those complaining of gastrointestinal symptoms should be questioned closely as to their eating habits prior to their coming to work, and it will be frequently seen that those who have complaints are the "coffee and doughnut breakfast eaters."

COMMENT

From the results of these investigations it is apparent that the increased use of tetryl will result in a great number of cases of industrial illness with which many physicians have heretofore been completely unfamiliar. The incidence of tetryl illness in our series may seem unusually high, but we believe that a similar incidence will be found in the early days of production at all shell loading plants under similar conditions.

If the precautions which we have cited are rigidly followed, a good deal of illness and lost time can be prevented. The importance of close, conscientious medical supervision of employees dealing with tetryl cannot be overemphasized. It is this surveillance which allows a majority of employees with tetryl illness to continue at their work until 60 per cent of them develop an apparent tolerance which makes possible uninterrupted production. Our investigations definitely emphasize that any one in a tetryl building is subject to illness. Earlier literature has usually considered only operators in direct contact with the substance.

We wish to stress our feeling that tetryl illness is not confined to purely local symptoms. Our cases of rather rapidly developing secondary anemia,[7] increased irritability and pronounced anorexia cannot be ignored. We strongly suspect that tetryl in cases of prolonged exposure could cause renal or hepatic damage, but we have as yet been unable to substantiate this view.

As has been mentioned, employees with mild tetryl dermatitis or illness are allowed to continue their work. We have found that it is to our advantage to remove those with severe primary dermatitis from tetryl contact permanently. The 3 employees who required hospitalization had severe primary reactions, and 2 of them were accidentally reexposed.

The problem of tolerance and increased sensitization [7] is a delicate one, and it is best interpreted by the examining physician who comes in contact with a multitude of cases. Certainly the reactions which we have seen cannot adequately be explained by either the local chemical or the local mechanical theories. It should be recognized that tetryl dermatitis or any symptom of tetryl illness is based on a sensitization of the body to the provoking agent.

7. A communication dealing with more general use of the protective cream, with secondary anemia and with sensitization will follow.

8. Schwartz, Louis: Indust. Med. **10**: 379 (Sept.) 1941.

9. Phenol sensitivity has frequently been seen here.

IMPORTANCE OF RECTAL EXAMINATION IN THE PROGNOSIS OF RECTAL CARCINOMA

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The rectum is a relatively common site for the appearance of carcinoma. Carcinoma of the rectum ranks fifth in the incidence of carcinoma of the human body and second only to that of the stomach in carcinoma of the gastrointestinal tract. It accounts for approximately 60 per cent of all intestinal carcinoma and approximately 5 per cent of all of the carcinoma in the body.[1] Carcinoma of the intestine, rectum and anus ranks third in the causes of death from cancer in Virginia.[2]

Carcinoma of the rectum is curable in a high proportion of cases when treated early. Five year cures have been reported in as high as 43.8 per cent [3] and 46 per cent [4] of cases. The operability of rectal carcinoma varies with individual clinics, having been reported in between 50 and 75 per cent with a tendency to increase in later years.[5]

The purpose of this paper is to point out some of the obstacles to cure of carcinoma of the rectum and to emphasize the manner in which these obstacles may be overcome.

One hundred consecutive cases of carcinoma of the rectum treated at the University of Virginia Hospital during the past ten years have been reviewed and tabulated according to the number which were adequately examined by local physicians prior to diagnosis in this clinic. Since practically all of the tumors in this series of cases were palpable from below, for the purpose of this study an examination has been considered adequate if the local physician had performed a digital examination of the rectum. It is, of course, understood that in all cases digital examination should be supplemented by anoscopic and proctoscopic examination with sigmoidoscopic examination, barium enema and biopsy when indicated. Almost none of the patients here reported on had had these additional studies before being seen in this clinic.

In addition, these patients have been studied as to operability and the method of treatment of both the operable and inoperable patients. The criteria for inoperability have been those related to the lesion itself rather than to general conditions, that is, the size and extension of the local growth and the presence of regional, hepatic, pulmonary or even more remote metastases. The patients have not been classified as inoperable because of age, cardiovascular disease or renal disease.

Table 1 demonstrates the relatively low proportion of cases in which an adequate examination was performed by the local physician and also the extremely high proportion of cases in which the examination by the local physician was inadequate and the lesion was not diagnosed until the patients were examined at this clinic. It will be noted that in only 36 per cent was the examination by the local physician adequate and in 33 per cent an entirely inadequate examination had been performed by the local physician. A great majority of these 33 patients were treated symptomatically with ointments or suppositories for their rectal complaint, or in a number of instances when hemorrhoids were the presenting finding hemorrhoidectomy without further examination had been performed. In 26 of the case histories it was impossible to tell with any degree of certainty whether an adequate examination had been performed by the local physician. These patients were listed as questionable. Five patients did not consult local physicians and came directly to this hospital for diagnosis and treatment.

TABLE 1.—*Rectal Examination Prior to Diagnosis at the Clinic*

Examination adequate	36
Examination inadequate	33
Examination questionable	26
No local physician	5
Total	100

TABLE 2.—*Method of Treatment of Rectal Carcinoma*

Operability and Method	Patients		Deaths
Operable			
Resection			
One stage	18		
Two stage	6		
After radiation	3		
		27	2 (7.4%)
Other treatment			
Fulguration and excision or radiation plus perineal excision	6		
Refused operation	5		
		38	
Inoperable			
Colostomy	32		
Colostomy plus radiation	8		
Radiation	6		
No treatment given	4		
		50	
Operability questionable and exploration refused		12	
		100	

In chart 1 the data have been grouped according to the adequacy of examination of the patient by the local physician and the percentage of operable, inoperable and doubtfully operable patients in each group. It will be noted that the highest percentage of operable patients, except for the small group that came directly to this hospital for treatment, occurs in the group who were adequately examined by the local physicians. In this group 47 per cent were operable and 47 per cent were inoperable. In 6 per cent the operability was questionable but exploration was refused. In the group of patients who were inadequately examined by their local physicians only 36 per cent were operable, while 46 per cent were inoperable and in 18 per cent operability was questionable and exploration was refused. The lowest percentage of operability occurred in the group whose examinations by local physicians were questionable. In this group only 23 per cent were definitely operable, 62 per cent were definitely inoperable and in 15 per cent operability was doubtful and exploration was refused. It is probably significant that the highest percentage of operable patients occurred among those who were adequately examined by local

From the Department of Surgery and Gynecology, University of Virginia Hospital, Charlottesville, Va.

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4. Jones, T. E.: Operability and Factors That Increase Curability of Carcinoma of the Rectum, Surg., Gynec. & Obst. **70:** 291-294 (Feb., No. 2A) 1940.
5. David, V. C., and Gilchrist, R. K.: Extension of the Borderline of Operability in Cancer of the Rectum, Ann. Surg. **115:** 566-573 (April) 1942. Goligher, J. C.: The Operability of Carcinoma of the Rectum, Brit. M. J. **2:** 393-397 (Sept. 20) 1941. Rankin, F. W.: Cancer of the Rectum and Rectosigmoid: Its Surgical Treatment, Surg., Gynec. & Obst. **72:** 213-221 (Feb.) 1941. Stone, H. B., and McLanahan, Samuel: Surgical Aspects of Carcinoma of the Large Bowel, J. A. M. A. **113:** 2282-2288 (Dec. 23) 1939. Cattell.[3] Jones.[4]

physicians and that the rate of operability was considerably less in patients who were not examined by local physicians. It may also be of significance that the lowest percentage of operability occurred in that group in which examination by the local physician was doubtful and that the highest percentage of inoperability occurred in this group. One might infer from these observations that the majority of this group had not been adequately examined by local physicians. The last group of 5 cases is so small that the high rate of operability, 60 per cent, is probably of no significance.

In chart 2 the patients have been grouped according to operability. They have been divided into the operable group, the inoperable group and a third group in which the operability was doubtful and exploration was refused. Each group has been further subdivided according to adequacy of examination by the local physician. The rate of operability for this entire series, 38 per cent, is relatively low and is considerably less than in most individual series represented. However, this may in part be explained by the fact that this hospital cares for a large number of indigent patients and that a relatively large proportion of these patients probably endure their symptoms for many months before consulting a physician.

It will be noted among the group of operable patients that 45 per cent had had adequate examinations by local physicians. Thirty-two per cent of these were not examined adequately by local physicians. In 16 per cent the examination was doubtful, and in 7 per cent no local physician was involved. Among the group of inoperable patients only 35 per cent had had adequate examinations by local physicians, 30 per cent were inadequately examined, in 32 per cent the examination was questionable and 4 per cent had had no local physician. In the group of patients for whom operability was doubtful but exploration was refused, 18 per cent had been adequately examined, 50 per cent had had

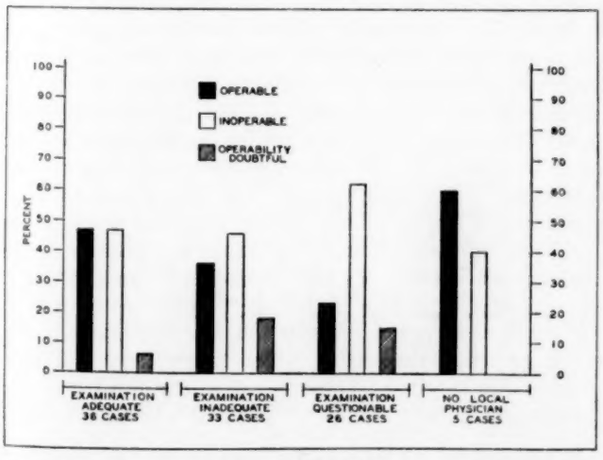

Chart 1.—Data on patients grouped according to adequacy of examination and charted in percentage of operability.

inadequate examinations by local physicians and 32 per cent presented no clearcut history indicating whether adequate examination had been performed or not. It is probably significant that the adequacy of early examination was greatest in the group of operable patients. However, the percentage of patients who had inadequate examinations is approximately the same in the operable and inoperable groups. The highest percentage of inadequate examinations occurred among those patients in whom operability was doubtful. This is probably of no significance. Of the operable patients there was some question as to examination by local physicians in only 16 per cent; there was some doubt as to examination in 32 per cent of the inoperable group and in 32 per cent of the group in which operability was doubtful. The higher percentage of operability in that small group who came directly to the hospital is probably of no significance.

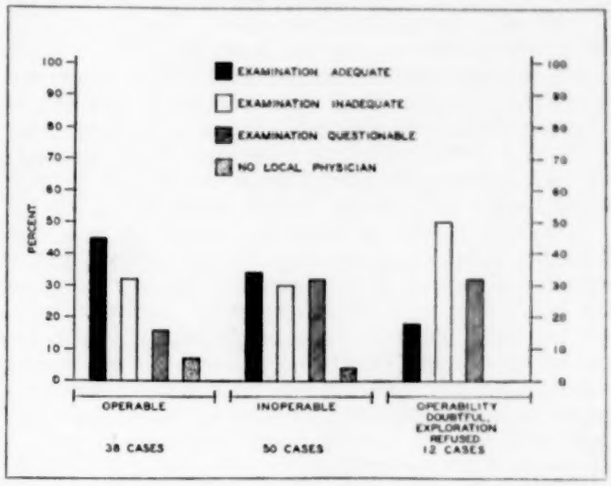

Chart 2.—Data on patients grouped according to operability and charted in percentage of adequate examinations.

Table 2 presents data arranged according to operability of the patients and to the type of treatment employed. It will be noted that a total of 27 underwent resection, with 2 deaths, or a mortality of 7.4 per cent. Six were treated in some other manner, such as fulguration and excision or radiation plus perineal excision. There were no deaths in this group. Five of the patients who were thought to be definitely operable by clinical examination refused operation. Of the inoperable patients, 32 were treated by colostomy alone, 8 were treated by colostomy plus radiation and 6 by radiation alone; for 4 it was thought not advisable to carry out any treatment. For 12 patients there was some controversy as to the operability, and all of these refused exploration. Including the 5 patients who were thought to be definitely operable, a total of 17 patients, or 17 per cent of the series, refused treatment. This is a slightly higher incidence for refusal of treatment than most authors report.[4]

COMMENT

The foregoing data emphasize the importance of an ordinary digital examination of the rectum at the earliest opportunity once the patient consults a physician with the history of change of bowel habits and/or blood and mucus in the stools. It seems reasonable to assume that of the 15 patients who were inadequately examined by their local physicians and who were found to be inoperable at the time of examination at this hospital a majority might have obtained the benefit of curative surgery had the diagnosis been established at an early date. Other authors[6] have indicated an even higher percentage of unfavorable cases as being directly the result of incomplete examination. Jones[7] estimated that the local physician was at fault in 85

6. Rankin, F. W.: Common Errors in the Diagnosis and Treatment of Cancer of the Colon and Rectum, South. M. J. **30:** 386-392 (April) 1937. Wijnen, Elise: The Physician and Preventable Cancer Deaths, Diplomate **10:** 255-261 (Nov.) 1938. Jones.[7]

7. Jones, T. E.: Early Diagnosis and Treatment of Carcinoma of the Rectum, South. M. J. **34:** 35-38 (Jan.) 1941.

to 90 per cent of unfavorable cases. Other authors [8] have stressed the importance of an educational program for general practitioners as well as for the lay public concerning the importance of early diagnosis in carcinoma of the rectum.

Examples among this group of cases of inadequate examination by the local physician may be cited. A 51 year old white woman had had rectal discomfort with bleeding and alternating periods of constipation and diarrhea for nearly three years. She was treated by hemorrhoidectomy by the local physician without being given an adequate examination. In addition, she was treated for one month postoperatively by a second physician for rectal stricture without the diagnosis of carcinoma of the rectum being made. Examination in the University of Virginia Hospital revealed a large tumor easily palpable by digital examination.

A second instance of inadequate examination by the local physician was that of a 16 year old white boy who complained of anal tenesmus, blood and mucus in the stools and pain on defecation for twelve months. He had been under the care of his local physician for the seven months prior to the time of examination in this hospital, and a digital examination had never been performed. Examination revealed a large tumor mass just inside the anal orifice, which on biopsy proved to be grade 3 adenocarcinoma.

A third patient, a 43 year old white woman, complained of rectal bleeding with constipation, rectal urgency and hemorrhoids for ten months. Her physician treated her hemorrhoids with suppositories and referred her to a surgeon six months prior to examination in this hospital. The surgeon performed a hysterectomy and failed to diagnose the carcinoma of the rectum. The growth in this instance also was easily palpable by rectum.

There are other factors directly attributable to the patient which limit the number of cures of carcinoma of the rectum. Of the 17 inoperable patients in this series each of whom had been adequately examined by the local physician at the first visit, it is probable that had the patient consulted his physician at an earlier date a more favorable prognosis might have resulted. The negligence on the part of the patient in consulting a physician when symptoms first appear is perhaps due to two factors: First, some patients are too embarrassed to seek advice and examination and, secondly, the symptoms often cause little discomfort and do not incapacitate the patient enough to impress him with the seriousness of his condition. Bargen and Leddy [9] studied 200 consecutive patients with rectal carcinoma seen at the Mayo Clinic and found that only 46 per cent had consulted physicians within one month after the first appearance of symptoms. The remaining 54 per cent did not consult physicians until two to twenty-four months after the onset of symptoms.

The third cause of an unfavorable prognosis in rectal carcinoma which is also attributable to the patient is refusal of treatment once the diagnosis has been established. In this series 5 patients who were thought clinically to be operable and 12 others in whom operability was equivocal refused surgical exploration, a total of 17 per cent. Jones [4] estimated that 10 per cent of his patients refused treatment.

8. MacCarty, W. C.: The Size of Operable Cancers, Am. J. Cancer **17**: 25-33 (Jan.) 1933. Markowitz, Benjamin: Carcinoma and the General Practitioner, Illinois M. J. **86**: 66-68 (July) 1935.

9. Bargen, J. A., and Leddy, E. T.: Carcinoma of the Rectum: Some Causes for the Poor Prognosis, J. A. M. A. **104**: 1201-1203 (April 6) 1935.

One other point of importance that should be stressed is the high incidence of rectal carcinoma in younger people. Four patients in this series were under 30 years of age and 1 was only 16. Other writers [10] have stressed the importance of thorough rectal investigation in young persons with rectal complaints.

SUMMARY

1. The greatest responsibility for early diagnosis and treatment of rectal carcinoma falls on the general practitioner.

2. Any patient of any age who presents himself with a history of change in bowel habits and/or blood or mucus in the stools should have a thorough rectal examination, including proctoscopic investigation, at the earliest opportunity.

3. The treatment of recurrent or prolonged diarrhea without rectal examination is to be condemned.

4. The treatment of hemorrhoids by surgical or conservative measures without first an investigation of the upper part of the rectum is also condemned.

THE THERAPEUTIC EFFICIENCY OF DIETHYLSTILBESTROL ESTERS

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AND
J. P. GREENHILL, M.D.
CHICAGO

The comparison of the activity of various estrogens for therapeutic standardization has until recent years depended for the most part on results obtained with laboratory animals. It has been frequently pointed out, however, that assays of estrogens vary extremely in the hands of investigators using different species of animals as well as various strains of the same animal. It is obvious that such a basis for the comparison of estrogens leads to confusion, and a number of investigators have recently suggested that estrogens be assayed directly in studies on man. In this regard changes in the endometrium or vaginal smear of menopausal women have been used for determining the potency of several estrogens.[1] We have pointed out that the use of the endometrial biopsies for assaying purposes is awkward and not sufficiently accurate, since a significant percentage of women in the menopause have varying degrees of endometrial development even without having received estrogen therapy and that specimens of the same endometrium differ when taken from different sites in the uterus.[2] The vaginal smear technic in the human being appears to be reliable [3] but here again

10. Bacon, H. E., and Sealy, W. B.: Malignancy of the Anus, Rectum and Sigmoid Colon in the Young, Am. J. Surg. **45**: 339-347 (Aug.) 1939. Mayo, C. W., and Madding, G. F.: Carcinoma of the Rectum and of the Rectosigmoid in the Young, Arch. Surg. **40**: 83-89 (Jan.) 1940. Rosser, Curtice, and Kerr, J. G.: Cancer of the Rectum in Young Persons, J. A. M. A. **113**: 1192-1194 (Sept. 23) 1939.

Miss Bertha Kutscheid, R.N., aided in this work.

From the Endocrine-Gynecology Clinic, Mercy Hospital, and Loyola University School of Medicine.

1. Werner, A. A.: Survey of Estrogenic Dosage: Collective Review, Internat. Abstr. Surg. **73**: 49-54, in Surg., Gynec. & Obst., July 1941. Papanicolaou, G. N., and Shorr, E. F.: The Action of Ovarian Follicle Hormone in Ovarian Insufficiency in Women as Indicated by Vaginal Smears, Proc. Soc. Exper. Biol. & Med. **33**: 585 (Jan.) 1935.

2. Freed, S. C.: Human Assay of Estrogens, Herbert M. Evans Anniversary Volume, to be published.

3. Shorr, E. F.; Robinson, F. H., and Papanicolaou, G. N.: A Clinical Study of the Synthetic Estrogen Stilbestrol, J. A. M. A. **113**: 2312 (Dec. 23) 1939. Stoddard, F. Jackson, and Metzger, Ida.: A Clinical Comparison of Three Commercial Estrogenic Preparations, J. Clin. Endocrinol. **2**: 209 (April) 1942.

untreated menopausal women have varying degrees of cornification, and care must be exercised in selecting only those with sufficiently atrophic vaginal mucosae. There is also a need for data on the quantitative response of the vaginal mucosa to known amounts of estrogens for use as a basis in assaying estrogens. We[4] have proposed a method for determining the potency of estrogens by using the subjective response of menopausal women. In this method nonspecific factors have been to a considerable extent reduced through proper selection of patients, elimination of certain psychic factors and the use of multiple dosage levels. Only patients with moderate or severe symptoms including at least two to four hot flashes daily are used for testing. In treating these patients no suggestion or promise of relief is made, and the patients are not informed of the nature of the medication they are receiving. The relief of all patients is evaluated by one of us in order to make for uniform results. We change the dosage levels without informing the patient. With this technic we have determined the minimal effective dosages of diethylstilbestrol, hexestrol, octofollin and estrone sulfate,[5] all of them being administered orally. For estrogens that are administered by injection we have adopted a technic whereby the length of the period of relief following the last of a series of injections is an index of the therapeutic efficiency of the estrogens.[6] This method has been used in the present study in testing the efficiency in the human beings of diethylstilbestrol esters.

It is well known that esterification of estrogens improves their efficiency owing to the fact that such a modification delays the absorption of the estrogen from the site of injection, thereby preventing excessive destruction by the body as well as allowing for an even and prolonged effect. The fatty acids chosen for esterification of estrogens as well as other hormones such as testosterone, estradiol and desoxycorticosterone have, however, depended on data obtained in the laboratory animal. In such animals it has been shown that the various esters, though having prolonged effects, are less active in regard to minimal effective doses than the free compound. A compromise was therefore made in selecting those esters which have a relatively slight decrease in activity together with a relatively long period of effect. In regard to diethylstilbestrol, the dipropionate was chosen because it possesses these properties. The higher fatty acid esters were ignored because of their apparent great loss in activity. Thus, while the minimal effective dose of the dipropionate is three to five times greater than that of diethylstilbestrol, the dipalmitate is fifty times greater.[7] Theoretically, therefore, this compound would be far inferior to the dipropionate. In order to determine whether this relationship holds for the human being, the three substances diethylstilbestrol, diethylstilbestrol dipropionate and diethylstilbestrol dipalmitate[8] were compared, the prolongation of relief from menopausal symptoms being used as the criterion of efficiency.

4. Freed, S. C.; Eisin, W. M., and Greenhill, J. P.: Assay in the Human of Synthetic Estrogen 118 B (Octofollin), J. Clin. Endocrinol. **2**: 213 (April) 1942. Freed.[2]
5. Freed, S. C.; Eisin, W. M., and Greenhill, J. P.: Assay in the Human of Estrone Sulfate, to be published.
6. Freed, S. C., and Greenhill, J. P.: Therapeutic Use of Estrone Suspensions, J. Clin. Endocrinol. **1**: 983 (Dec.) 1941.
7. Dodds, E. C.; Golberg, L.; Lawson, W., and Robinson, Sir Robert: Synthetic Estrogenic Compounds Related to Stilbene and Diphenylethane: Part I, Proc. Roy. Soc. London, s. B. **127**: 140 (May 18) 1939.
8. These three substances were supplied by Abbott Laboratories. The diethylstilbestrol dipalmitate has a melting point of 77-78 F.

METHODS AND RESULTS

These three compounds were injected into menopausal patients with moderate or severe symptoms once a week for three weeks. Five mg. of diethylstilbestrol was administered at each injection. The amount of the esters injected was calculated to contain an equivalent of 5 mg. of the active component diethylstilbestrol. After the third injection the patients were observed at intervals of two to three weeks, and placebo injections were administered in order to eliminate as much as possible the psychic factor of injection. At each visit the patient's relief was evaluated according to the disappearance of hot flashes and other peripheral vascular effects and other well known symptoms of the menopause such as nervousness and irritability.

Table 1 shows the number of weeks following the last injection for which each of the patients was free from symptoms.

All patients except those represented by 0's obtained satisfactory or excellent relief of symptoms. From this

TABLE 1.—*Period of Relief in Weeks Following Cessation of Therapy* *

Diethylstilbestrol	0, 0, 0, 4, 4, 4 — 1, 1, 1, 1, 1, 1, 5, 6, 6, 6, 6 — 2, 2, 2, 7, 8, 8 — 3, 3, 3, 3, 3, 3, 11, 14, 14
Diethylstilbestrol dipropionate	0, 0, 4, 5, 5, 5 — 1 — 2, 2, 2, 2, 2, 6, 6, 6, 6, 6, 6, 9, 9, 11, 11, 11, 11, 11 — 3, 3, 3, 6, 6, 6 — 4, 4, 4, 4, 4, 4, 7, 7, 7, 7, 7, 8, 14
Diethylstilbestrol dipalmitate	0, 1, 2, 3, 4, 5, 5, 5, 5, 6, 7, 8, 8, 8, 8, 8, 9, 9, 9, 10, 10, 10, 10, 11, 11, 11, 12, 12, 12, 12, 12, 12, 14, 14, 14, 14, 14, 14, 14, 16, 18, 20, 20

* Each number represents the result in one patient.

TABLE 2.—*Incidence of Nausea (With and Without Other Symptoms Such as Vomiting, Headache and Dizziness)*

	Total Number of Patients	Patients With Nausea
Diethylstilbestrol	32	15
Diethylstilbestrol dipropionate	41	6
Diethylstilbestrol dipalmitate	43	1

table it is apparent that diethylstilbestrol is inferior to the dipropionate in efficiency, since the period of effective relief is significantly less than that of the ester. Thus, for example, 9 out of 32 patients receiving diethylstilbestrol obtained either no relief or relief for only one week, while only 3 patients out of 41 who received the dipropionate were similarly affected. The dipropionate was effective on an average of five weeks, or about one week longer than was the diethylstilbestrol. Diethylstilbestrol dipalmitate, on the other hand, was far more effective than the dipropionate. Patients obtained relief for an average of nine to ten weeks following the last injection, and only 5 of 43 patients had less than five weeks' relief, compared to 18 of 41 with dipropionate and 21 of 32 with diethylstilbestrol.

The incidence of toxicity following administration of diethylstilbestrol compounds is of considerable interest since this offers one of the greatest disadvantages to their use. Table 2 shows the incidence of toxicity following the administration of these three compounds, the development of nausea being used to indicate toxicity.

It can be seen from this table that the dipropionate is considerably less toxic than the free compound, con-

firming the results of others in this respect.[9] Dipalmitate is practically free from toxicity, since only 1 patient out of 43 complained of nausea.

COMMENT

Our results demonstrate once again the limitations of using laboratory assays as a basis for therapeutic standardization. We have shown that the compound diethylstilbestrol dipalmitate, which in the rat requires an amount fifty times greater than diethylstilbestrol to produce an effective response, is far more potent in the human being. Similarly it is significantly more efficient than the dipropionate, which was selected for therapeutic use as the most efficient fatty acid ester on the basis of laboratory data. It is most likely that the relationship of efficiency of these three compounds is reversed in the human being from that of the rat as a result of different rates of absorption and utilization of the compounds. It is indeed interesting that diethylstilbestrol dibenzoate,[10] which is comparable to the dipalmitate in the rat in regard to the minimal effective dose and the prolongation of effect, approximates in the human being the action of the dipropionate. Selection of the appropriate esters or other modifications of estrogens should, therefore, be determined only by direct assays in the human subject and not by clinical application of data derived from experimental animals. It is quite possible that fatty acids of higher types other than palmitic acid would be even more efficient. The latter was selected only because the wide divergence of minimal effective dosages offered an opportunity to demonstrate striking results.

The low incidence of toxicity of the diethylstilbestrol esters and especially the dipalmitate is highly gratifying, since the chief disadvantage to the use of diethylstilbestrol has been the relatively frequent side reactions. The reduction in incidence in toxicity appears to be in direct proportion to the decrease in rate of absorption of the fatty acid compounds. This substantiates our previous postulation[11] that the disagreeable symptoms following administration of diethylstilbestrol resulted from its rapid introduction into the blood stream, a condition found also in early pregnancy, in which condition similar symptoms are present.

In our hands diethylstilbestrol dipalmitate appears to be an ideal estrogen. It is highly effective, its action is prolonged over a long period and it gives rise to little or no unpleasant reaction. It is entirely possible that similar high fatty acid esters of other compounds such as testosterone, desoxycorticosterone and estradiol may show a similar increase in efficiency when tested in the human being.

SUMMARY

Diethylstilbestrol, diethylstilbestrol dipropionate and diethylstilbestrol dipalmitate have been assayed for their therapeutic efficiency in the human being, the subjective response of menopausal patients being used as the criterion of efficiency. Diethylstilbestrol dipalmitate is superior to the others in having a considerably prolonged period of effect together with little or no toxicity. Our results demonstrate once again the limitations of using laboratory animals for therapeutic standardization and the necessity of testing such compounds directly in the human being.

9. Greene, R. R., and Dorr, E. M.: Relation of Dose and Type of Estrogen to Nausea and Vomiting, J. Clin. Endocrinol. **1**: 821 (Oct.) 1941.

10. Freed, S. C.; Eisin, W. M., and Greenhill, J. P.: Unpublished work.

11. Freed, S. C.: Recent Progress in Estrogen Therapy, Illinois M. J. **80**: 139 (Aug.) 1941.

Clinical Notes, Suggestions and New Instruments

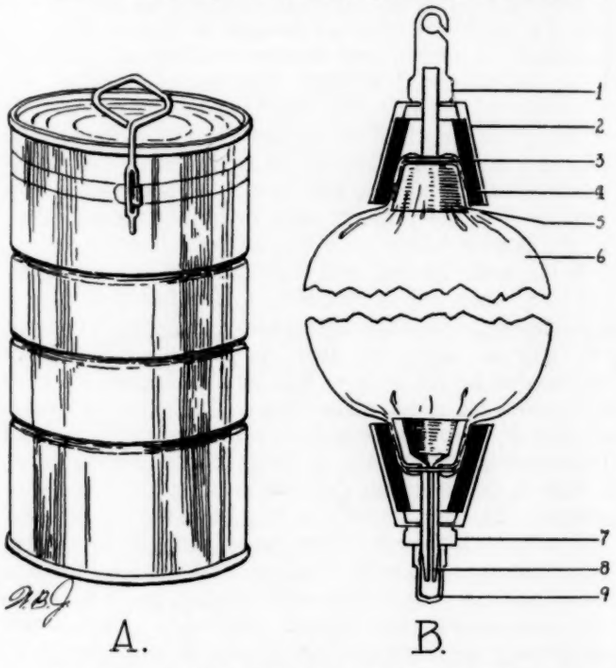
A VENOCLYSIS UNIT RESISTANT TO FREEZING

A. C. IVY, PH.D., M.D., AND S. C. HARRIS, M.S., CHICAGO

Fluids for venoclysis are now dispensed in glassware, which will fracture when handled roughly or when the contents are frozen. It was deemed advisable, for reasons unnecessary to record here, to have a venoclysis unit devoid of these objections.

Distilled water and various solutions for intravenous use may be packed in properly fabricated enamel lined tin cans. However, the solutions are not readily evacuated from the cans without risk of contamination, and the duration of the reliability of solutions so packed is relatively short because corrosion cannot be prevented to an extent that renders the method free from danger.

To obviate these difficulties, it was necessary to find a unit which was resistant to corrosion and which could be placed in a can. Various types of rubber bags and plastics were first employed, but when the package, packed under vacuum, was sterilized the solutions became contaminated, as evidenced by the odor and taste and by the presence of pyrogenic substances. After much experimentation it was found that a Visking sausage casing (Visking Corporation, Chicago) was a suitable container for fluids intended for venoclysis. For closing the ends of the casing, various plastics were found to be unsuitable because they became deformed on heating or freezing and imparted objectionable qualities to the solution. Further experimentation showed that an aluminum alloy (Aluminum Company of America) electroplated with aluminum oxide was sufficiently inert chemically to be used for closing the ends of the casing.



A, the can, in which the venoclysis unit (*B*) is packed, shows the beads for rigidity against freezing and the keg opening device. 1, the hook for hanging the unit. 2, aluminum alloy cap, fitting snugly against the rubber washer (4), which seals the Visking bag, which is turned back over the aluminum ring (3), which in turn clamps the Visking bag against the solid aluminum-alloy base (5). The dispensing end of the unit is closed like the end for hanging. The nut (7) holds the aluminum alloy cap against the rubber washer as (1) at the end for hanging. The adapter (8) is machined to take a hypodermic needle, and (9) is the cap sealing the opening and protecting the adapter. In the top of the cap (9) a specially prepared cork washer is placed to secure the seal.

After the various parts of the unit shown in the illustration are cleaned and properly prepared, 600 cc. of triple distilled

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From the Department of Physiology and Pharmacology, Northwestern University Medical School.

water or solution is placed in the unit, the outside of the unit is rinsed and the unit is placed in the can, which is closed under vacuum and autoclaved. The packed can (American Can Company) may then be subjected to freezing (— 35 F. overnight), to an altitude of 45,000 feet and to one to two atmospheres of pressure without rupture of the contents or injury of the contained unit. The only disadvantageous feature of the pack is that, because of the permeability of the Visking bag, from 20 to 40 cc. of the solution passes out into the can when exposed to the vacuum packing procedure. The unit should be wiped with a towel when lifted from the opened can.

One end of the unit is provided with an adapter (covered by the cap in the illustration) to take a Luer hypodermic needle or a rubber tube. The other end is provided with a hook for suspension. The unit does not require a breather, since it collapses with gravity or can be squeezed with the hand to speed the flow of solution. In fact a small can containing a rubber or Visking tube of small bore, a hypodermic needle with adhesive tape and antiseptic gauze could be placed in a small tin container. This in turn could be soldered to the larger can, thus providing a complete emergency kit for the intravenous administration of fluid, or supplying distilled water for the solution of a package of dried plasma or serum.

Such units have been packed with distilled water, 0.9 per cent sodium chloride solution, Locke's solution, 5 per cent dextrose solution and 6 per cent acacia in 0.9 per cent sodium chloride solution. At various times up to six months after packing, 500 cc. quantities of such solutions have been given intravenously during twenty to thirty minutes to dogs trained to lie quietly without any elevation of rectal temperature over a period of five hours. The solutions by bacteriologic test have been sterile. Traces of iron and aluminum have been found in the solutions only after six months. In several instances the can had corroded in small areas and stained the bag. This may be avoided by giving the cans an extra coat of enamel after the beads in the wall of the cans have been formed. (The beads are necessary to give the can strength to withstand freezing.)

Through the courtesy of Drs. C. M. Davison and F. J. Leseman Jr. of Cook County Hospital, 14 nonfebrile patients have received 500 cc. of 0.9 per cent sodium chloride solution intravenously from units packed and kept in an incubator (38 C.) for one month. No subjective symptoms were reported by the patients, and the rectal temperature recorded hourly for five hours showed no change greater than that normally observed.

SUMMARY

A venoclysis unit resistant to freezing and rough handling has been constructed. Various solutions used clinically have been packed in the unit and found to be suitable for intravenous use as evaluated on human subjects and on dogs. Solutions so prepared and stored appear to be stable and unaltered for at least six months; however, observations on man have not been extended beyond one month.

TYPHUS FEVER IN A PREVIOUSLY VACCINATED LABORATORY WORKER

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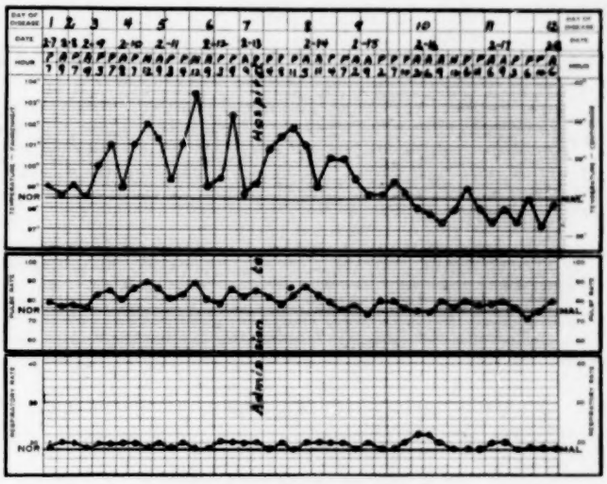
GLENOLDEN, PA.

History of Present Illness.—Dr. B. H., a white woman aged 45, was well until Feb. 7, 1942, when malaise, slight headache and fever developed. At 7 p. m. her temperature was 99 F. The next day the symptoms were unchanged and she reported to work on the 9th; she felt well during the morning but in the afternoon she was unduly fatigued and feverish. There was loss of appetite and considerable sweating. On the 11th severe aching pain developed across the back of the head and lasted throughout the duration of fever. There was no vomiting and the bowel movements were regular. Fever and headache were the outstanding complaints when one of us (H. G.) saw the patient on the 12th at 9 p. m. Her temperature then was 102.4 F., with a corresponding rise in the pulse and respiration. The skin was dry and hot. The tongue was slightly coated. Careful physical examination failed to disclose any pathologic abnormalities. Catheterized urine was normal and the white blood cell count was 4,200 cells per cubic millimeter. The past medical and family histories were irrelevant.

Because of the occupational history and absent physical manifestations, we suspected that this bizarre fever was atypical typhus and advised hospitalization. She was admitted to the Chester Hospital on the 13th. The urine was again found to be normal, and the complete blood count was reported as red cells 3,930,000, hemoglobin content 13 Gm., white cells 4,100, polymorphonuclear leukocytes 58 per cent (segmented 18 per cent, band 37 per cent, metamyelocytes 2 per cent, myelocytes 1 per cent), lymphocytes 42 per cent. Severe headache persisted until the 15th, when it decreased in intensity and then disappeared in thirty-six hours. The headache came in paroxysms accompanying the bouts of fever. During febrile remissions the patient had no complaints except that she felt weak and tired. Profuse sweating occurred at night. On the 14th two to three small pale pink macules were noted on the upper part of the abdomen. They disappeared under pressure and lasted only a few hours. The spleen and liver



Temperature, pulse and respiratory rate.

were not palpable. The temperature became normal on the 17th and the patient began to have a good appetite. On the 16th the blood count was reported as red cells 3,450,000, hemoglobin content 12 Gm., white cells 7,900, polymorphonuclear leukocytes 65 per cent, eosinophils 1 per cent, monocytes 4 per cent, lymphocytes 29 per cent, basophils 1 per cent. She was discharged from the hospital on the 19th and returned to work six days later. There were no sequelae. Her temperature record is shown.

Occupational History.—Eggs previously inoculated with typhus virus (Breml strain) had been harvested by the patient with the assistance of a technician. Sterile gowns, goggles, face masks and rubber gloves were worn throughout the procedure. The patient cracked the eggs over a sterile pan and removed the yolk sacs with sterile forceps. After collection of the yolk sacs, grinding was done in a Waring Blendor. The container of the mixer was covered with phenolized gauze and a metal top. Because of the possible occurrence of air borne infection from a fine spray, the material was allowed to settle after being ground before the metal top was removed. The material was then poured into a bottle under phenol gauze and diluted and solution of formaldehyde was added.

The patient came in contact with the virus for the first time on Jan. 20, 1942 when she harvested forty-one eggs (length of exposure thirty minutes). On January 26 she harvested fifty-six eggs (forty minutes). On February 3 she handled

From the Medical Research Division, Sharp & Dohme, Inc.

one hundred and twenty-one eggs (two hours) and on February 9 she harvested one hundred and thirty-two eggs (two hours). There was no history of injury or accidental exposure to the virus.

Immunologic History.—In anticipation of her assignment to the typhus vaccine division the patient was actively immunized against typhus by means of three weekly injections (1 cc. each) of Cox yolk sac vaccine supplied by the National Institute of Health. After a control bleeding had been obtained the first dose was given on Nov. 7, 1941. A follow-up sample of blood was obtained on December 1, ten days after the third dose of vaccine had been injected (shown in the accompanying table). On the day the patient began to harvest inoculated eggs (Jan. 20, 1942) she received her fourth dose (1 cc.) of the National Institute of Health vaccine. Her present illness began eighteen days after this repeat injection. Blood obtained on February 11 and 12, on the fifth and sixth days of illness, was injected intraperitoneally into guinea pigs. Of 5 animals thus inoculated only 1 (inoculated with the specimen of February 11) had an elevation of temperature beginning the sixteenth day. From this guinea pig a strain of European typhus was isolated and maintained in serial passage.

The results of agglutination [1] and complement fixation tests [2] performed before, during and after the illness are shown in the table.

Agglutination Tests

Date	Proteus Vulgaris O X 19, Dilutions							European Rickettsiae, Dilutions					Complement Fixation	Comment
	1:20	1:40	1:80	1:160	1:320	1:640	1:1,280	1:20	1:40	1:80	1:160	1:320		
11/7/41	+++	++	+	±	0	—	—	0	0	0	0	—	0	Before vaccination
12/1/41	+++	++	+	±	0	—	—	+	±	0	0	—	0	10 days after the third dose of vaccine
2/11/42	+++	+++	++	+	0	0	—	++	++	+	0	—	1:64	5th day of fever
2/12/42	+++	+++	++	+	0	0	—	+++	++	+	0	—	—	6th day of fever
2/19/42	++++	++++	++++	+++	+++	+	±	+++	+++	+++	+	±	1:1,024	13th day of illness, convalescence
3/ 9/42	++++	++++	+++	++	±	0	0	++++	++++	+++	++	±	1:1,024	31st day after onset of illness
4/ 1/42	++++	++++	++	++	±	0	0	++++	++++	+++	+	0	1:512	54th day after onset of illness

COMMENT

The isolation of the European strain of typhus virus from the patient's blood on the fifth day of illness proves beyond doubt that we were dealing with a case of atypical (modified) typhus fever. Further corroborative evidence is to be found in the rise of the agglutinin titer to both Proteus vulgaris O X 19 and typhus rickettsia displayed by the patient during convalescence.

Infection apparently occurred by way of the respiratory tract, following what appears to have been a light exposure to the virus, in spite of the use of extraordinary protective measures and previous immunization with the National Institute of Health vaccine. Four cc. of this vaccine given within seven weeks failed to give the patient complete protection against typhus. On the other hand, partial protection apparently resulted therefrom, as evidenced by the mild type of typhus fever (without rash) that ensued. It may be argued that the mildness of the infection was rather the result of a light exposure. Against this hypothesis we may recite the fact that the technician who assisted our patient and who underwent a similar degree of exposure to the virus did not contract the disease. This may be accounted for by the difference in their immunologic response to vaccination against typhus fever. Our patient's response was poor, while in the case of the technician, who had been similarly vaccinated before exposure, it was good. Ten days after the third dose of vaccine, the technician's blood serum showed rickettsial agglutinin titer of + in a 1:80 dilution.

This factor of poor response to vaccination and the possible occurrence of atypical (modified) typhus infection in such vaccinated persons raise important public health problems, especially under war conditions. From the clinical course in our case, which in the first few days could have been incorrectly diagnosed as grip or influenza, it is clear that the occurrence of unexplained fever among troops vaccinated against typhus and who are operating in known endemic areas must be suspected as possibly due to typhus until proved otherwise. As demonstrated in our patient, the virus can be recovered from the blood of vaccinated persons early in the disease. This would call for the prompt isolation of all persons with suspected typhus fever to prevent them from becoming the center of epidemics of the classic form of the disease among the nonvaccinated population.

ADDENDUM

Since the foregoing report was submitted for publication, we have successfully treated a second case of laboratory typhus infection in a vaccinated technician. The patient, a woman aged 25, had been working for three months in the typhus vaccine division of Sharp and Dohme when on May 9, 1942 she accidentally splashed the contents of a syringe (about 5 cc. of a suspension of European typhus virus) on her face and right eye. Four days later she came down with fever, and the clinical picture that developed thereafter was similar to that of our first case. Photophobia, muscular aching, hyperesthesia to deep pressure and mental depression were prominent features. On the fourth day of fever, four pale pink macules were noted on the epigastrium. They disappeared in twenty-four hours. The febrile period lasted four days (100-102 F.) and the patient made a complete recovery in a week. We failed to recover the virus, perhaps because the specimens of blood studied were obtained too early (on the first and second days of fever) but the diagnosis was confirmed by the steep rise in the agglutinin titers to Proteus vulgaris O X 19 and European rickettsiae that occurred after the eighth day of illness (rickettsial agglutinins + in 1,280 dilution).

Previous to the onset of typhus fever, the patient had received three weekly 1 cc. injections of the N. I. H. vaccine (last dose, Feb. 4, 1942) followed by two injections of 0.5 cc. and 1.0 cc. respectively (Feb. 12 and 24) of an egg yolk typhus vaccine prepared by the Sharp and Dohme laboratories, which was richer in rickettsiae than the N. I. H. antigen. Following vaccination there was no change in the Weil-Felix reaction, but the rickettsial agglutinin titer rose from 0 to + in 1:40 dilution on the ninth day after the third dose of vaccine and to + in 1:80 dilution five weeks after the fifth dose of vaccine. Similarly the complement fixation became positive in 1:4 and 1:8 dilutions on these two dates. Yet this patient developed modified typhus fever following the accidental exposure that occurred about eleven weeks after the fifth dose of vaccine had been injected. This corroborates the conclusions deduced from the first case.

1. Fitzpatrick, Florence, and Hampil, Bettylee: Am. J. Pub. Health **31**: 1301-1305 (Dec.) 1941.
2. Performed by Dr. Ida Bengtston, National Institute of Health, Bethesda, Md.

PLACENTA ACCRETA

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Placenta accreta is a serious but fortunately a rare complication of labor. Meyer and Ashworth [1] found 118 authentic cases after careful search of the literature up to 1940. The reported incidence of this condition differs greatly, varying from 1 in 3,000 to 1 in 40,000 deliveries. As a rough estimate, it probably occurs about once in every 10,000 deliveries.

The chief pathologic change in placenta accreta is a complete or partial absence of the decidua basalis, which allows the villi to burrow directly into the uterine musculature and prevents separation of the placenta after delivery.

Any condition producing primary atrophy of the endometrium may be a predisposing factor. Conditions which have been implicated include previous manual removal of the placenta, too thorough curettage, submucous fibromyomas, endometritis and possibly dyshormonism, since hormones play an important role in the formation of the decidua.

The chief symptom of this condition is brisk bleeding when an attempt is made to deliver the placenta. This usually continues until manual removal of the placenta is attempted, and the operator finds it firmly adherent to the uterus, there being no line of cleavage. Persistent attempts at manual removal result in increasing the bleeding or in perforation of the uterus.

All authorities agree that immediate hysterectomy is the treatment of choice. Mortality from conservative attempts at removal is five or six times that of cases treated radically.

The case to be described was considered worth recording because the situation was such at the time when the diagnosis was made that laparotomy was absolutely contraindicated not only by the severe shock but by the evidence of sepsis, and conservative management was the only alternative. Anderson [2] has reported a case which was treated very similarly.

REPORT OF CASE

Mrs. F. M., aged 26, was a white primigravida with negative past medical record with the exception of an appendectomy in 1927. Physical examination was negative. Pelvic measurements were within normal limits, and the blood Wassermann reaction was negative. The antepartum course was entirely uneventful.

On Jan. 11, 1941 she was admitted to St. Francis Hospital in active labor. Five hours later a normal female child was delivered by low forceps. There was no bleeding for forty-five minutes following delivery, the uterus being very firm. After repair of the episiotomy an unsuccessful attempt was made to express the placenta by the Credé method. The patient was anesthetized again with nitrous oxide and oxygen and an attempt made to remove the placenta manually. This maneuver was difficult because of the firm contraction of the uterus. The placenta could be outlined, but separation could not be accomplished without danger of rupturing the uterus. There was no line of cleavage, and the organ seemed to be a.. integral part of the uterine wall.

The patient was returned to her room in mild shock; 1,000 cc. of isotonic solution of sodium chloride was administered intravenously. Twelve hours after delivery, persistent but not profuse vaginal bleeding developed and the patient complained of severe abdominal cramplike pain, which was only partially relieved by morphine.

Because of persistent vaginal bleeding and slow but steady elevation of the pulse rate, manual removal of the placenta was attempted again twenty-four hours after the first attempt but was again unsuccessful. A presumptive diagnosis of placenta accreta was then made, but, because of the poor condition of the patient, hysterectomy was considered unwise. A transfusion of 600 cc. of citrated blood was given at this time.

The patient's condition became progressively worse, and on the third postpartum day she developed severe abdominal distention, with evidence of sepsis: temperature 105 F., pulse rate 150, erythrocytes 2,400,000 and leukocytes 16,000, the differential count showing 5 per cent juvenile, 52 per cent stab and 29 per cent segmented neutrophils. Wangensteen duodenal suction was used to relieve the distention. The vaginal discharge became very profuse and foul smelling. A transfusion of 500 cc. of citrated blood was given every other day from the third to the eleventh postpartum day. On the alternate days 4 Gm. of sodium sulfapyridine was administered intravenously in 1,000 cc. of isotonic solution of sodium chloride every eight hours. Owing to lack of laboratory equipment, blood sulfapyridine levels were not determined. Five cc. of azosulfamide solution was injected every four hours for two days, and then 2 cc. every four hours, intramuscularly.

The temperature began to subside on the ninth postpartum day and remained normal after the fourteenth day. The patient was discharged from the hospital on the nineteenth postpartum day and remained in bed at home until the thirty-second postpartum day, when she had regained enough strength to begin walking. Improvement from that time was rapid. There was no vaginal discharge, and the uterus had decreased definitely in size. Three months following delivery she had a normal menstruation and has had no menstrual difficulty since. Pelvic examination has shown the uterus to be normal in size and shape, anterior and freely movable. Apparently recovery has been complete.

COMMENT

The case reported by Anderson [2] differs from this in that hysterectomy was done later and the diagnosis of placenta accreta was verified microscopically. In our patient, improvement continued under conservative management to the point where there was no indication for surgical attack when her general condition would have justified such intervention. Evidently the placenta sloughed out in the profuse, foul discharge, although no portion of it was ever identified. The resumption of normal menstruation after three months supports this assumption.

The present report constitutes no good argument for the conservative treatment of placenta accreta, which should normally be treated by hysterectomy, but does indicate that the condition of a patient with this abnormality is not necessarily hopeless, even when laparotomy is contraindicated.

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1. Meyer, J. H., and Ashworth, J. W.: Placenta Accreta, Virginia M. Monthly **67**: 36 (Jan.) 1940.
2. Anderson, H. E.: Placenta Accreta, Am. J. Obst. & Gynec. **42**: 545 (Sept.) 1941.

A NOTE ON PALMAR ERYTHEMA (SO-CALLED LIVER PALMS)

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A palmar erythema has been occasionally noted by clinicians or mentioned because of its association with Laënnec's cirrhosis [1] but has never been adequately described. This not uncommon lesion consists of a symmetrical, erythematous, capillary and arteriolar dilatation involving the eminences of the palms and the digits of the hands, rarely the soles, at times extending over the fingertips to the nailbeds and lateral distal phalanges. It may exist in all gradations from a diffuse or blotchy redness to multiple small telangiectatic areas but is characteristically well demarcated and limited to the sites mentioned. In its milder stages the palmar eminences may be involved without digital erythema.

A review of 30 patients who presented this disorder revealed that it was encountered most frequently in cirrhosis (5 of 20 consecutive patients admitted with this diagnosis had palmar erythema) but also in chronic diseases of the alimentary tract such as ulcer, colitis or neoplasm, rheumatoid arthritis and in chronic febrile illnesses, i. e. leukemia, chronic suppuration and subacute bacterial endocarditis. In addition it was occasionally noted in thyrotoxicosis and rheumatic heart disease and in senile and debilitated patients and was found rarely in apparently normal individuals.

In an attempt to correlate this lesion with the history, physical examination and laboratory findings, it was observed that by far the majority of the patients had been ill for many months, and 21 gave a definite history of prolonged dietary insufficiency. Eleven of the group showed associated signs of a deficiency

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1. Patek, A. J.: Medicine, to be published.

state such as a smooth, red tongue, peripheral neuritis or cheilosis. Although anemia was common, it was not a necessary concomitant. In 14 cases in which data were available, no consistent relationship to reduced or altered serum proteins or deranged liver function was suggested. Three weeks of intensive therapy with thiamine hydrochloride, nicotinic acid, riboflavin or brewers' yeast caused no observable change; yet 2 patients with Laënnec's cirrhosis, who responded favorably to a high carbohydrate and high vitamin regimen, showed disappearance of palmar erythema after about a four months period had elapsed.

Examination of the lesions demonstrated blanching on pressure, with more rapid return of color than is true in the normal hand. Fading of the erythema did not take place with elevation of the hand, and definite flushing synchronous with the arterial pulse was seen when the color was partially obliterated by pressure with a glass slide. With the inconstant exception of patients with rheumatoid arthritis, whose moist palms felt cooler as the result perhaps of increased vaporization, hands with palmar erythema were often unusually warm to the touch.

In 5 cases no change in appearance could be noted when a blood pressure cuff was placed on the arm between systolic and diastolic levels, and only slight fading took place when pressures above systolic readings were introduced with the arms elevated vertically. If the erythema was reduced by massaging the involved areas while the cuff was inflated, full color reappeared as the pressure was lowered to 40-50 mm. of mercury. In addition to this suggestive evidence of increased arteriolar flow, capillaries were found to be more numerous and dilated on direct microscopic examination. Immersion of the hands for three minutes in water at 3 or at 37 C. had no effect.

Epinephrine (0.5 cc. of 1:1,000 solution), given hypodermically to 3 patients, produced slight fading in color, and 0.3 cc. injected into the brachial artery caused prompt and profound blanching of the hand on the side of the injection and minimal alteration on the opposite side. Atropine subcutaneously or by vein resulted in no change, nor was the erythema affected by ulnar nerve procaine block or electrical stimulation of the same nerve in these 3 cases.

Pathologic examination of the lesions of 2 patients who died of cirrhosis showed no microscopic vascular or other abnormalities in skin or subcutaneous tissues.

SUMMARY

A palmar erythema, a peripheral vascular dilatation involving chiefly the eminences of the palms and digits, has been observed. Although its cause remains obscure, it is usually associated with chronic disease and prolonged dietary insufficiency or deficiency states.

THE TREATMENT OF DELIRIUM TREMENS

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The problem of the treatment and care of patients with delirium tremens is well known. Usually large quantities of sedatives, drastic purgatives and frequent spinal taps are used. The patient remains strapped in bed, straining against his bonds and raising considerable disturbance. The difficulty of treating associated conditions such as lobar pneumonia, perforations of the bowel or fractures of all kinds are greatly prevented by the actions of the patient in delirium.

Many such problems occurred at St. Mary's Hospital. We would like to present our comparatively simple treatment used on a number of patients in recent months. We employ an intravenous injection of 50 cc. of 50 per cent dextrose, 8 cc. of vitamin B_1 (approximately 25,000 units) and 25 units of insulin, all in one injection, as soon as the diagnosis is made. Sedation of any kind is not given. The straps are kept in readiness but have not been used. In the course of two hours, the patients become quiet and calm and for the first time say they feel well. Usually one injection is sufficient, but in the case of chronic alcoholism an injection of the same dose or half the dose, depending on the condition, is sometimes necessary the next day. The patients are started on a light diet of Sippy character and vitamin B complex 2 tablets three times a day. Soon they eat well and are subjectively and objectively improved.

Because St. Mary's Hospital is essentially a busy city hospital, blood chemistry studies were not carried out routinely. Treatment was instituted as soon as a diagnosis was made. Delirium tremens is considered by many to be the result of a cerebral edema with involvement of the cerebral, spinal and peripheral nerves. Many of the patients with delirium tremens have not eaten regularly for days, weeks and even months and consequently have a disturbed metabolism of fat, carbohydrates and proteins. The dextrose decreases the cerebral edema temporarily; the insulin stimulates the appetite and allows the sugar to burn in the presence of vitamin B_1, preventing a return of the edema; the oxidation of fat is reinitiated. Vitamin B_1 is a generally accepted treatment for conditions of this type involving the central nervous system and incidentally increases the desire for food.

This treatment has been used on 15 patients with complicated and uncomplicated delirium tremens with success. In 1 case a hypoglycemic reaction was promptly controlled with 6 ounces (180 cc.) of orange juice and 1 teaspoon of sugar. The treatment was used in cases complicated with pneumonia with equally good results; it was also used with benefit and uneventful recovery in 1 case of alcoholism complicated with perforated peptic ulcer in which delirium tremens developed postoperatively.

Further investigation in the field of chemical determinations of the blood may help to decide the exact roles played by the vitamin B_1, insulin and dextrose.

From the St. Mary's Hospital, Dr. Joseph F. Londrigan, Medical Director.

Dr. Cannon is the attending physician, Drs. Modarelli and DeVincenzo are assistant attending physicians and Dr. Swiney is the medical intern.

Special Article

HANDBOOK OF NUTRITION: V

WATER AND SALT REQUIREMENTS IN HEALTH AND DISEASE

JOHN H. TALBOTT, M.D.

BOSTON

These special articles on foods and nutrition have been prepared under the auspices of the Council on Foods and Nutrition. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council. These articles will be published later as a Handbook of Nutrition.—Ed.

Salts and water of the body are inextricably bound in their interchange between organism and environment. This generalization applies particularly to sodium, potassium, chloride, bicarbonate, phosphate and protein, electrolytes which are the principal contributors to the pattern of intracellular and extracellular fluid. The exchange of these electrolytes and the exchange of water comprise the theme of this chapter. Several other electrolytes present in the human organism such as magnesium, calcium, lactate, iron, iodide and urate are osmotically unimportant for fluid balance and will not be discussed. The anatomy of body fluids, i. e. the structural compartments and the concentration of electrolytes, will be outlined first. It will be followed by an inquiry into the mechanism of the ingress of the several components into the body. The remainder of the review, which is proportionately longest, will be concerned with their egress from the body.

It is deemed most appropriate in the introduction to give credit to the masters in the field, Dill, Gamble,

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Hastings, Henderson, Peters, Smith and Van Slyke and others who by their researches, physiologic and clinical, have contributed in large measure to our present knowledge of body fluids. Several of their contributions have been freely drawn on in the preparation of this article.[1]

THE ANATOMY OF BODY FLUIDS

The fluid structures of the body, as was Gaul, are divided into three parts, blood, interstitial fluid (including lymph) and intracellular fluid. The volume of interstitial fluid is the most labile of the three and expands or contracts with the changing physiologic needs of the body such as occur during digestion, sleep or profuse sweating. In morbid disturbances of fluid balance this compartment likewise is the buffer between the other two and may undergo profound alteration that is not reflected in the volume of blood or volume of intracellular fluid. The resistance of these two compartments to change at the expense of interstitial fluid is an example of the rigorous and effective equilibrium exercised by the body, i. e. homeostasis. The concentration of electrolytes occupies an intermediary position with regard to capacity to change under varying stresses. The concentration of electrolytes is maintained within a narrow range in health in each of the three major compartments of body fluids. In sickness the concentrations of plasma and interstitial fluid electrolytes yield before the integrity of intracellular fluid is threatened.

The amount of fluid in the body is approximately 70 per cent of the total mass. This is distributed as follows: The volume of circulating blood plasma is approximately 5 per cent of the total body weight, or 3.5 liters in a person of 70 Kg. (154 pounds). Interstitial fluid comprises 15 per cent of body weight, or 10.5 liters. Intracellular fluid comprises 50 per cent of body weight, or 35 liters in a person of 70 Kg.

The values quoted have been derived from experimental procedures, direct and indirect. Plasma volume may be determined in the intact animal or in man by noting the dilution of an intravenously injected nontoxic dye by a method similar to that described by Gregerson, Gibson and Stead.[2] Only small amounts of plasma are needed for the determination if the readings are made in a photocolorimeter.[3] Whole blood volume is calculated directly from plasma volume by taking into account the hematocrit reading. Interstitial fluid volume may be determined simultaneously if a few decigrams of sodium thiocyanate [4] is injected with the dye. No satisfactory method has been devised for determining volume of intracellular fluid or of total body water in human beings. This is a serious void in the armamentarium of the clinical investigator. The values given for these components have been deduced from sacrifice experiments on animals.

The concentration of electrolytes in the fluid compartments of the body except blood is less amenable to experimental determination than are the volumes. Whole blood and plasma are the only phases that may be approached directly. The concentrations in interstitial fluid, however, are similar to their concentrations in a protein free filtrate of plasma. This is fortuitous and, if information is available concerning plasma, deductions concerning interstitial fluid are probably valid. The concentration of electrolytes in arterial plasma of a normal person is given in the accompanying table.

The concentrations in venous plasma, except for bicarbonate, are essentially the same as for arterial plasma. Inspection of the data shows that the sum of the acids equals the sum of the bases. The solution is slightly alkaline, the p_{H_s},[5] which is an index of the hydrogen ion concentration, being 7.40. Within the limits p_H 4 to p_H 10 the contribution of H and OH ions to the foregoing summation would be negligible. The sum of the four bases may be expressed as total fixed base or total inorganic base. There is only a negligible quantity of organic base in the plasma of normal persons. Total fixed base may be determined with a high degree of accuracy by electrodialysis using not more than 0.2 cc. of material.[6] If the bases are determined individually, 1 or 2 cc. of material is needed for the respective constituents (sodium,[7] potassium,[8] calcium,[9] magnesium [10]). The value for the sum of the individual bases is useful as a check against total fixed base, while both are useful as a check against the sum of the determined acids. No single procedure has been devised for the determination of total acids as has been devised for total base. Organic and inorganic acids are present in health and in disease. The acids may be determined individually on 1 cc. or less of plasma

Concentration of Electrolytes in Arterial Plasma

Bases	mEq. per Liter	Acids	mEq. per Liter
Sodium	140	Chloride	104
Potassium	4	Bicarbonate	25
Calcium	5	Proteinate	17
Magnesium	2	Phosphate	2
		Lactate	1
		Undetermined	2
Total	151	Total	151

1. Dill, D. B.: Life, Heat and Altitude: Physiological Effects of Hot Climates and Great Heights, Cambridge, Harvard University Press, 1938. Gamble, J. L.: Extracellular Fluid and Its Vicissitudes, Bull. Johns Hopkins Hosp. **61:** 151, 1937; Renal Defense of Extracellular Fluid: Control of Acid-Base Excretion and the Ratio of Water Expenditure, ibid. **61:** 174, 1937. Peters, J. P.: Body Water: The Exchange of Fluids in Man, Baltimore, Charles C. Thomas, 1935. Henderson, L. J.: Blood, a Study in General Physiology, New Haven, Yale University Press, 1928. Smith.[22]

2. Gregerson, M. I.; Gibson, J. J., and Stead, E. A.: Plasma Volume Determination with Dyes: Errors in Colorimetry; the Use of the Blue Dye T-1824, Am. J. Physiol. **113:** 54, 1935.

3. Gibson, J. G., 2d., and Evelyn, K. A.: Clinical Studies of the Blood Volume: IV. Adaptation of the Method to the Photoelectric Microcolorimeter, J. Clin. Investigation **17:** 153, 1938.

4. Crandall, L. A., Jr., and Anderson, M. X.: Estimation of the State of Hydration of the Body by the Amount of Water Available for Solution of Sodium Thiocyanate, Am. J. Digest. Dis. & Nutrition **1:** 126, 1934.

5. The subscript s stands for serum. Practically, there is no difference between hydrogen ion concentration of serum and plasma. Since most of the experimental work is done on plasma rather than serum, a more appropriate designation would be p_{HP} in place of p_{HS}.

6. Consolazio, W. V., and Talbott, J. H.: The Determination of Total Base in Biological Material by Electrodialysis, J. Biol. Chem. **132:** 753, 1940.

7. Butler, A. M., and Tuthill, E.: An Application of the Uranyl Zinc Acetate Method for Determination of Sodium in Biological Material, J. Biol. Chem. **93:** 171, 1931.

8. Consolazio, W. V., and Talbott, J. H.: Modification of the Method of Shohl and Bennett for the Determination of Potassium in Serum and Urine, J. Biol. Chem. **126:** 55, 1938.

9. Clark, E. P., and Collip, J. B.: Study of the Tisdall Method for the Determination of Blood Serum Calcium with a Suggested Modification, J. Biol. Chem. **63:** 461, 1925.

10. Cruess-Callaghan, G.: A Method for the Microdetermination of Magnesium, Biochem. J. **29:** 1081, 1935.

(chloride,[11] bicarbonate,[12] proteinate,[13] phosphate,[14] lactate [15]). If microprocedures are employed it is possible to collect thoroughly reliable data of the complete acid-base pattern of plasma with not more than a total of 10 cc. of material, which may be obtained from 20 cc. of whole blood.

The nomenclature milliequivalents per liter (mEq./L) used to express concentration of constituents seems formidable to many physicians. It is no more mysterious, however, than milligrams or centimeters to the uninitiated. If concentrations are expressed in milliequivalents per liter, values for different constituents readily may be compared, as in the statement previously made that the sum of the bases should equal the sum of the acids. Comparison would be impossible if a heterogeneous nomenclature were used and sodium were expressed as milligrams per hundred cubic centimeters, protein as grams per hundred cubic centimeters and bicarbonate as volumes per hundred cubic centimeters.[16]

Sodium and chloride comprise the bulk of the electrolytes in plasma and interstitial fluid. The presence of potassium in plasma is little more than evidence of its migration to and from intracellular spaces. Protein is essential for maintenance of osmotic pressure in the blood. It is expressed as the acid proteinate in the table. Bicarbonate and phosphate participate in two functions. Both are waste products of metabolism but in the process of elimination contribute to the regulation of the acid-base equilibrium of the body.

THE INGRESS OF WATER AND SALT INTO THE BODY

Water gains entrance into the body in health by way of the upper gastrointestinal tract. It may be ingested as a liquid or as the fluid content of foodstuffs. A small quantity of water in addition is formed within the body daily during the metabolism of foodstuffs. The fluid requirements of persons who live a sedentary life are satisfied ordinarily by the habitual intake of fluid with and between meals. Most persons do not wait until they are thirsty to take liquids but have learned by habit that periodic ingestion keeps them from becoming thirsty. Following inadequate intake of fluid or increased loss from the body, such as is produced by sweating during strenuous exercise, the sensation of thirst appears.

The pathogenesis of thirst has not been decided with finality, but Dill [1] has presented several convincing arguments from the available experimental data. He has concluded that:

> Thirst does not necessarily depend on a dry mouth. Thirst without a dry mouth is experienced by man at the evening meal after hard work on a hot day. It is experienced by marine teleosts despite a constantly flowing stream of water through the mouth. Normal dogs without salivary glands do not exhibit unusual thirst.
>
> Thirst does not have a single dependence on osmotic pressure of body fluids. A small increase in osmotic pressure produced by ingestion of sodium chloride produces intense thirst, while if the same increase in osmotic pressure is induced by urea the thirst is only moderate.
>
> Thirst does not depend on volume of blood plasma nor of extracellular phase of other tissues. Intraperitoneal injection of glucose solution reduces the volume of the extracellular phase without causing thirst.
>
> Thirst depends on diminished water content and possibly increased osmotic pressure of body cells. While thirst may be somewhat alleviated by rinsing the mouth, it can be satisfied only when water has been delivered by the blood stream to the tissue cells that are demanding it.
>
> The mechanism by which the demand for water makes itself known remains to be elucidated. Contractions of the smooth muscle of the esophagus may be involved.

Thirst is a sensation that man has associated with lack of fluid in the body and usually is satiated by ingestion of water. Thirst associated with dehydration, however, whether in sickness or in health, is probably an index of salt lack as well as fluid lack. Indeed, if dehydration is profound, ingestion of water without sodium chloride does not satiate. The ability to distinguish between desire for water and desire for salt is believed by students of natural history to be highly developed in animals. Man presumably has lost this fine sense of discrimination. It is possible that during the evolutionary era a trick was played on man, since his need for salt is quite as vital as that of animals.

A detailed presentation of the intake of the salts will not be attempted. Except for certain unusual circumstances the requirements of the body should be satisfied by the salts in the diet. This will be considered at length by Icie G. Macy in another article in this series.[18]

EGRESS OF WATER AND SALT FROM THE BODY

Fluid is lost from the body in expired air, sweat, gastrointestinal discharges and urine. The losses through the first three channels total approximately 2 liters daily and are essentially beyond voluntary control. The quantity of water which remains for disposal after these requirements have been satisfied is voided by the kidneys. The kidneys act in this capacity as the buffer organ for excretion of fluid just as interstitial fluid is the buffer compartment for storage of fluid. If an excess of water has been taken into the body, the kidneys are called on to excrete it. If the quantity of body water is less than normal, little or no urine may be voided. The other excretory channels, meanwhile, continue to have their requirements satisfied.

Respiration is a complex mechanism that involves loss of water vapor, gas exchange and regulation of the acid-base equilibrium of the body. The delivery of oxygen to the alveolar spaces and to the circulating hemoglobin in the pulmonary vessels is a vital process. The removal of carbon dioxide occurs simultaneously and permits large quantities of acid to be eliminated.

The concentration of bicarbonate in the acid-base table is given as 25 mEq. per liter of arterial plasma. This is the concentration of carbon dioxide bound to base. An

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12. Van Slyke, D. D., and Neill, J. M.: The Determination of Gases in Blood and Other Solutions by Vacuum Extraction and Manometric Measurement, J. Biol. Chem. **61:** 523, 1924.

13. Peters, J. P., and Van Slyke, D. D.: Quantitative Clinical Chemistry, Baltimore, Williams & Wilkins Company **2:** 516, 1932.

14. Tschopp, E., and Tschopp, E.: Ueber die Reduktion der Phosphormolybdänsäure zu "Molybdänblau" und über die quantitative Bestimmung von Phosphat- neben Silikat- und Arseniationen in der Biologie, Helvet. clin. acta **15:** 793, 1932.

15. Edwards, H. T.: Simplified Estimation of Lactate in Normal Human Blood, J. Biol. Chem. **125:** 571, 1938.

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17. Footnote deleted on proof.

18. Macy, Icie G.: The Principal Mineral Elements in Nutrition, J. A. M. A., to be published.

additional small amount, approximately 1/20 of 25 mEq. per liter, is in solution in the water of the plasma. This is free carbon dioxide, the concentration of which is conditioned by the partial pressure of carbon dioxide in the alveolar air, which is dependent successively on pulmonary ventilation. The sum of free and bound carbon dioxide is known as total carbon dioxide content, the amount obtained from the Van Slyke gasometric determination. The total carbon dioxide content of plasma in healthy persons is of the same order of magnitude as the carbon dioxide combining power. There may be a considerable discrepancy, however, between these values in certain disturbances of acid-base balance. Determination of total carbon dioxide content is to be preferred to determining combining capacity, as it is a more reliable procedure and productive of more information.

The p_H of plasma is dependent on the ratio of free to bound carbon dioxide as well as the total content of carbon dioxide. When this ratio is disturbed, acidosis or alkalosis results. Acidosis, such as is observed in nephritis and in diabetic coma, is associated with a decrease in concentration of total carbon dioxide. This depression is reflected in both free and bound carbon dioxide with a relatively greater effect on the bound fraction. On the other hand, the familiar type of alkalosis which follows the ingestion of alkaline powders is accompanied by an increased total carbon dioxide content with a relatively greater increase in bound carbon dioxide.

Since the p_H of plasma is determined by the ratio of free to bound carbon dioxide, there are two other possible combinations of acid-base disturbance. Both are relatively uncommon and follow an unorthodox pattern. Hysterical hyperventilation is an example of alkalosis with the total carbon dioxide content of the plasma below normal.[19] Superficially one might expect acidosis with a low carbon dioxide content. The body fluids show increased alkalinity, however, since free carbon dioxide is reduced proportionately more than bound carbon dioxide. On the contrary, with obstruction of the respiratory passages or emphysema an acidosis results. The total carbon dioxide content of the blood, meanwhile, is above normal. The elimination of carbon dioxide from the alveolar spaces is impeded, free carbon dioxide accumulates in the plasma and the ratio is shifted to the acid range.

Sweating, like respiration, is a highly integrated process. The excretion of water in the sweat is necessary for dissipation of heat and maintenance of body temperature. It is expensive for the body, however, because of the seemingly unnecessary loss of salts. The content of sodium and potassium salts in sweat is appreciable, but they serve no known purpose. The sweat glands are developed sufficiently to elaborate a protein free filtrate of plasma, but they cannot produce a salt free filtrate. The concentration of sodium chloride is one-fifth to one-half as great as in plasma. The quantity, however, which may be dissipated daily by profuse sweating is not widely appreciated. Many persons sense that strenuous exercise in a high environmental temperature is accompanied by excessive sweating and salt loss. On the other hand, few persons are aware that a sedentary existence in a hot environment or strenuous exercise in a cold environment may be associated with a dissipation of significant quantities of sodium chloride. If strenuous exercise in a cold environment is undertaken by persons suitably clothed in woolens for protection, sweating is profuse and loss of salt may be significant. The matter of sodium chloride deficiency is of concern, therefore, to persons living in cold as well as in warm climates and to members of our armed forces undergoing heavy maneuvers in cold regions as well as in tropical regions.

The volume of sweat lost during eight hours of strenuous work in a hot environment may be as great as 10 or 15 liters, each liter containing as many as 3 or 4 Gm. of sodium chloride. Somewhat smaller amounts may be lost daily by patients with fevers. No ill effects may be attributed to the excessive exchange if amounts lost are replaced periodically. If this is not achieved, symptoms of sodium chloride deficiency may appear. Fluid depletion usually accompanies salt lack, such as in dehydration, but sodium chloride deficiency per se is associated with certain symptoms.

The gradual development of uncomplicated salt deficiency in a sedentary person leads to weakness, excessive fatigue, anorexia and nausea.[20] Physical performance is impaired and mental acuity diminished. A thirstlike sensation may appear which is not alleviated by ingestion of fluid. This sensation may be all that remains of the reaction of animals to lack of salt. There is no change in rate of resting pulse, blood pressure or body temperature. The development of many of these symptoms in hot climates has been attributed to some mysterious action of the tropics and has been called tropical languor. Be this as it may, sodium chloride deficiency is a real phenomenon and militates against optimal physical and mental performance.

If salt loss is accompanied by fluid loss, the usual consequence of strenuous activity, muscle cramps and prostration may develop. In previous writings these syndromes have been called heat cramps and heat prostration [21] because they have appeared usually in persons exposed to high environmental temperatures. With the recent interest in winter sports and the military campaigns of World War II, muscle cramps at least may be observed following strenuous exercise in cold regions as well as in hot regions. A more appropriate title, therefore, might be muscle cramps from salt loss rather than heat cramps. A syndrome similar to heat prostration probably is rare in cold environments. It is temporarily incapacitating in hot climates but is not a serious malady. During the 1941 army maneuvers in Louisiana and in the Carolinas several hundreds of soldiers were stricken with this malady. Attention to adequate sodium chloride intake will undoubtedly prevent similar disabilities in actual combat.

Muscle cramps from salt loss are painful spasms of the voluntary muscles and develop in persons engaged in strenuous physical activity. The pathogenesis of symptoms has been shown to be a function of decreased sodium chloride content of the body and not to water intoxication. Susceptibility to cramps varies among persons as well as with the duration of exposure to conditions which induce cramps. Susceptibility may

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20. McCance, R. A.: Medical Problems in Mineral Metabolism: III. Experimental Human Salt Deficiency, Lancet **1**: 823, 1936.

21. Talbott, J. H.: Heat Cramps, Medicine **14**: 323, 1935; Ill Effects of Heat: Modern Medical Therapy in General Practice, Baltimore, Williams & Wilkins Company, 1940, p. 1114.

reach a maximum during the first days of excessive sweating before adjustment and acclimation begin to operate. Acclimation is associated with a decreasing concentration of sodium chloride in the sweat, although the volume of sweat excreted may be unchanged. Particular attention should be given to salt intake during the first days of excessive sweating if cramps are to be avoided.

The prevention and treatment of sodium chloride deficiency is theoretically and practically a relatively simple matter. The salt intake should be increased if exposure to high temperatures is anticipated or if physical activity in the cold is contemplated. A daily intake of 15 Gm. of sodium chloride will protect against most symptoms of salt deficiency. Some persons will consume this amount in a high salt diet. Others need extradietary salt as salt tablets or a saline drink. If a central supply of drinking water is available such as in mills, in shops or in army barracks, table salt may be added at some convenient point to make a final concentration of 0.1 per cent. A solution of this low concentration has only a slightly saline taste if it is consumed cool and allays rather than promotes the sensation of thirst. It is thought to be the physiologic way to replace salt lost in the sweat. Since the body has a mechanism for detecting loss of water, i. e. thirst, only sufficient water will be ingested to satisfy this desire. With replacement of water, salt is replaced but only as is needed to restore amounts lost by sweating. In installations where the general salting of drinking water is not feasible, such as in combat bivouacs, reliance must be placed on salt added to food or contained in salt tablets. A 1 Gm. salt tablet (15 grains) may be taken with each half liter of water or a 0.5 Gm. tablet (7½ grains) taken with each cup of water. Although these recommendations are applicable to persons excreting excessive quantities of sweat daily, other persons, including those at sedentary jobs, will benefit from an increased salt intake during hot weather. The hazards to be considered from the recommendation on such a broad scale for use of liberal amounts of salt are not believed to be significant. The kidneys are capable of excreting any excess salt ingested except in renal failure and in the presence of edema. Of course if added salt is taken in the drinking water and thirst is allowed to dictate fluid requirements, the salt level in the body is merely maintained and the normal range is never exceeded.

A liberal intake of fluid is imperative for persons subjected to excessive sweating in hot weather. It is needed to provide available quantities for dissipation of heat as well as to maintain the internal environment of the body. The temperature at which water should be consumed may be governed by individual tastes. There is little evidence that cool water by itself is harmful. It has the advantage of a refreshing action in comparison with tepid water. The moderate use of nonalcoholic bottled beverages by adults subjected to considerable physical exercise in the summer is generally considered to be unobjectionable. The belief that an excessively low protein diet is necessary in hot weather is without experimental confirmation. An adequate protein intake (from 60 to 100 Gm. daily), in addition to supplying protein necessary for maintenance of muscle mass, provides more sodium chloride than a low protein intake.

The gastrointestinal tract requires a very small amount of fluid to keep the fecal mass from complete desiccation. Large amounts of fluid may be lost in sickness associated with emesis or diarrhea. Gastric juice contains a great deal of chloride but a relatively low concentration of base. Diarrhea discharges, on the other hand, tend to be alkaline with a preponderance of base, especially potassium.

Lastly, the kidneys excrete the remainder of available fluid after the demands of the lungs, skin and gastrointestinal tract have been satisfied. It is not intended to imply by this statement that this is a haphazard process, for in fact it is a very precise one. The kidneys are the buffer organ for fluid excretion; they also serve as a vital excretory organ for waste products and share with the lungs in the regulation of the acid-base equilibrium. The functions of excretion and acid-base regulation are performed by the nephrons, the functioning units of the kidneys, of which there are more than two million in a normal person. The nephrons are composed of the glomerulus, convoluted and collecting tubule and a blood supply. The afferent arteriole enters the glomerulus, carries blood to the glomerular capillaries for the elaboration of glomerular filtrate, becomes efferent after leaving the glomerulus, continues in intimate contact with the convoluted tubules through a second capillary network, and, after the functions of excretion and reabsorption are performed, becomes a venule. This schematic functioning unit of the kidney as presented by Smith [22] is a useful concept, as will be evident in the discussion of the specific duties of water and salt exchange. There is little support for the thesis that individual glomeruli and nephrons are active and inactive periodically or rhythmically. They are probably all working at the same optimum level in health, and what is happening to one is probably an index of what is happening to all. Anatomic and functional changes alter this situation in disease.

Approximately 1.2 liters of whole blood passes through the nephrons each minute. This is called effective renal blood flow [23] and is approximately one third of the total cardiac output. No other tissue of the body save for the lungs claims proportionately as great a volume of blood. The measurement of flow of blood to the kidney whereby this value is derived is an ingenious procedure. If a few cubic centimeters of diodrast, the same preparation used for pyelography, is introduced intravenously, a plasma level of approximately 2 mg. per hundred cubic centimeters may be achieved. All the diodrast at this plasma level which enters the afferent arterioles of the kidney is removed from the blood in the glomerular and tubular capillary networks. A portion is removed in the glomerular filtrate, the remainder by the excretory activity of the tubules. It is not important in the calculation of renal blood flow to consider the paths of removal from the blood. It must be assumed, however, that diodrast is not altered during its passage through the kidneys and that all the diodrast in renal arterial blood is removed by the nephron before the venule is reached and is excreted immediately into the collecting tubules. If the concentration of diodrast in the blood is determined accurately from a sample of plasma and the amount of

22. Smith, H. W.: The Physiology of the Kidney, New York, Oxford University Press, 1937.

23. Smith, H. W.; Goldring, W., and Chasis, H.: The Measurement of the Tubular Excretory Mass, Effective Blood Flow and Filtration Rate in the Normal Human Kidney, J. Clin. Investigation **17**: 263, 1938.

diodrast excreted per minute by the kidney is determined by urine analysis, it is possible to calculate renal blood flow. As an example, if the concentration of diodrast in the plasma is 2 mg. per hundred cubic centimeters and 14 mg. of diodrast is excreted per minute into the bladder, then 700 cc. of plasma must have entered functioning nephrons to provide for this quantity of diodrast. The calculation of whole blood flow from plasma flow is possible if the cell volume-plasma volume ratio is determined by the hematocrit reading. If whole blood contains 40 per cent of cells and 60 per cent of plasma, the plasma flow of 700 cc. is only 60 per cent of the total whole blood flow. Therefore $\frac{700}{60} \times 100 =$ approximately 1,200 cc. = renal whole blood flow.

The next step to be considered in an analytic discussion of the elaboration of urine is the formation of glomerular filtrate from a portion of the effective plasma flow. Rate of formation of glomerular filtrate is measured by clearance of inulin or mannitol,[22] starchlike polymers. They are not metabolized by the body if injected intravenously and appear unchanged in bladder urine. The path of excretion is exclusively through the glomerular membrane; the tubules neither reabsorb nor excrete either substance. If the concentration of inulin in the plasma is elevated to 100 mg. per hundred cubic centimeters and 125 mg. of inulin is excreted by the kidney into the bladder per minute, 125 cc. of plasma must have participated in the formation of glomerular filtrate to allow this quantity of inulin to be excreted. The rate of formation of glomerular filtrate is therefore 125 cc. per minute. This is characteristic of a healthy man; about one fifth of the effective renal plasma flow is concerned with glomerular filtration.

The formation of glomerular filtrate is the result of the excess hydrostatic pressure in the glomerular capillaries over and above the combined osmotic pressure of the plasma proteins and intraglomerular pressure. Formation of filtrate continues until the osmotic pressure of the plasma, due to concentration of proteins, increases and equalizes the pressure inside and outside the glomerular capillaries. Plasma proteins do not pass through the capillary walls, and a protein free filtrate of plasma is elaborated in the glomerulus. The concentration of electrolytes in glomerular filtrate except for protein is similar to arterial plasma. The qualitative and quantitative integrity of body water is thus maintained. After the formation of glomerular filtrate, the plasma with proteins which have been concentrated nearly 20 per cent flows into the efferent arteriole and subsequently into the contiguous capillary network about the tubule, where the remaining functions of renal activity are performed. Such functions include reabsorption of a large portion of glomerular filtrate, formation of ammonia and elimination of waste products by failure to reabsorb them. Most of the glomerular filtrate is attracted back into the capillary network through the tubular epithelium by virtue of the increase in osmotic pressure of the plasma, which has exceeded the decreased hydrostatic pressure. Approximately 90 per cent of the water and salts of the glomerular filtrate are reabsorbed by this mechanism. Urea, carbon dioxide and phosphate are the principal waste products that are not reabsorbed in proportion to fluid. All except 1 or 2 per cent of the remaining 10 per cent of the fluid of glomerular filtrate is reabsorbed by the tubular epithelium because of the presence of the antidiuretic hormone from the posterior pituitary gland. Only 1 or 2 per cent of the glomerular fluid in healthy persons finally finds its way into the bladder. This seemingly small percentage, however, is sufficient to account for the formation of 2 liters of bladder urine daily. One per cent of 125 cc. equals 1.2 cc. a minute, 70 cc. an hour, and 1,800 cc. in twenty-four hours.

The amount of glomerular filtrate formed is a remarkably constant function under controlled conditions and is not dependent on amount of fluid available for excretion into the bladder. A normal person with a surface area of 1.72 square meters should form approximately 125 cc. of filtrate a minute in the basal state. The mechanism of the action of the antidiuretic hormone which is responsible for variation in urine output depending on amount of available fluid has been summarized by Verney [24] as follows: "The administration of water causes, presumably through the mechanism of the central nervous system, an inhibition of the secretory activity of the pituitary gland. The preformed antidiuretic hormone gradually disappears from the circulating blood, but for a time, about thirty minutes, is present in sufficient concentration to restrain the activity of the kidney. As the concentration of pituitary hormone in the circulating blood diminishes, the rate of urine formation increases to a maximum. When as a result of diuresis much of the water excess is removed, the secretory action of the pituitary gland is resumed and the rate of urine formation diminishes."

The exchange of electrolytes by the kidney follows a channel similar to water. There is no conclusive evidence that any of the electrolytes are excreted by tubular activity. Most of the inorganic bases and acids in glomerular filtrate are reabsorbed to maintain the concentrations in the body. Since sodium and chloride are the predominant electrolytes in plasma, they are the predominant electrolytes in glomerular filtrate. Potassium is present in relatively low concentration in the plasma and may be reabsorbed by different tubular cells than those which reabsorb sodium; at least there is no reciprocal excretion of sodium and potassium by the kidney. On a high potassium intake, several times the quantity of potassium may be excreted in the urine as during a low potassium regimen; the sodium excretion meanwhile undergoes little change.[25]

Approximately 90 per cent of the sodium (and chloride) in glomerular filtrate is reabsorbed through the tubular epithelium because of the increased osmotic pressure. All of the remainder that is reabsorbed is subject to hormonal control just as is fluid. Desoxycorticosterone or a similar substance elaborated by the adrenal cortex exercises the control. Other steroids, such as esterone, progesterone and testosterone,[26] may participate, but their sodium retaining property is much weaker than that of desoxycorticosterone. In adrenal insufficiency, with inadequate elaboration of cortical hormones, normal quantities of sodium are not reabsorbed by tubular epithelium and a dissipation of this electrolyte in the urine is evident. The action of desoxycorticosterone may be demonstrated in normal persons

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26. Thorn, G. W., and Engel, L. L.: The Effect of Sex Hormones on the Renal Excretion of Electrolytes, J. Exper. Med. **68**: 299, 1938.

following an injection of this substance as well as in patients suffering from a deficiency of it.

An important contribution to our knowledge of sodium exchange has been made recently. While retention of pathologic amounts of sodium during the treatment of Addison's disease may follow excessive assimilation of the synthetic hormone desoxycorticosterone, abnormal retention of sodium has never been demonstrated following administration of excessive quantities of cortical extract prepared from animal adrenals. The explanation of this paradox has been presented by Thorn and his associates.[27] They have shown that 17-hydroxycorticosterone, one of the active principles in commercial preparations of adrenal cortex extract, has a demonstrable sodium excreting property which may be as potent as the sodium retaining property of desoxycorticosterone. During the use of adrenal cortex extract, the sodium retaining and sodium excreting factors are approximately balanced and edema does not develop. A similar mechanism presumably operates in health to maintain the constancy of sodium in the body.

Phosphate and bicarbonate participate in the regulation of acid-base equilibrium, particularly in the acidification of urine, during their elimination from the body. The reaction of glomerular filtrate is neutral; the reaction of bladder urine is acid. Two functions are achieved in the transformation of neutral glomerular filtrate into an acid urine. Base is retained and acids are lost. It is imperative that available base be retained, since the body has only a limited supply. All of the inorganic base found in the body is ingested in food and none is manufactured. Acids, on the other hand, are products of metabolism; they are manufactured in large quantities and must be excreted if life is to be maintained. Phosphate contributes to this regulation because it is a trivalent acid. Most of the phosphate (80 per cent) is dibasic at p_H 7.4, the reaction of glomerular filtrate. As the urine becomes acid, it loses its dibasic property and at 4.8 it is present as a monobasic salt. Base is thus conserved, while the quantity of acid which may be excreted is not diminished. Bicarbonate achieves a similar result by allowing base to be reabsorbed by tubular epithelium, leaving high concentrations of carbonic acid available for excretion in bladder urine.[28] Yet a third process participates in excretion of acid. This is the formation of ammonia from amino acids in the tubular epithelium. Quantities of ammonia are formed for neutralization of acid substances in health as well as in acidosis, meanwhile allowing inorganic base to be returned to the body.

There are two conditions which illustrate physiologic fluctuations and quasipathologic states of water and salt exchange. These are diuresis and dehydration, respectively. Diuresis is an interesting aberration of renal function which may be induced by an increased intake of fluid or by one of several drugs or chemical substances. Diuretics do not increase appreciably the rate of formation of glomerular filtrate. Some diuretics increase slightly the flow of blood through the kidney, but urine output is not affected by this increase alone. The principal effect is impaired reabsorption of water and salt by the tubules. The osmotic diuretics dextrose, sucrose and urea are present in high concentrations in glomerular and tubular urine and, because of their intrinsic osmotic pressure, they prevent normal reabsorption of water and salt. The xanthine diuretics are quite different chemical substances, although their action on renal exchange is similar to the osmotic diuretics. A small increase in rate of glomerular filtration is overshadowed by a significant depression in reabsorption of tubular urine. The action of the mercurial diuretics is solely on the reabsorptive mechanism; no extrarenal action has ever been demonstrated, nor is there any increase in rate of formation of glomerular filtrate.[29]

Dehydration may be caused by a number of disturbances and varies in degree from a mild state without detectable clinical signs to alarming severity associated with profound prostration and collapse. Either inadequate intake or excessive loss of water and salt from the gastrointestinal tract or kidneys may be responsible. During the early stages of uncomplicated dehydration there is a diminution in volume of interstitial fluid and plasma, while the composition of plasma with respect to water and salt concentration is maintained. If the disturbance is allowed to progress, interstitial fluid volume and plasma volume continue to decrease, and eventually serious alterations in electrolyte concentrations in the blood may be demonstrated. Serum protein, hematocrit and red blood cell counts are increased, while concentrations of serum sodium and chloride are decreased. If dehydration is complicated by acidosis, such as in untreated diabetes mellitus, the serum bicarbonate is decreased. On the other hand, in dehydration from loss of gastric juice, as in pyloric obstruction, the reaction of the blood is alkaline and the concentration of blood bicarbonate is increased. An increase in concentration of nonprotein nitrogen is a late effect produced by renal failure and by increased breakdown of body protein if supplies of carbohydrate are depleted.

Renal blood flow and formation of glomerular filtrate are unimpaired in the early stages of dehydration. Because of the ability of the human kidney to make a hypertonic urine, nitrogen products continue to be excreted with a very small urine flow while essentially all the sodium chloride is reabsorbed. Compensation cannot be maintained indefinitely as dehydration progresses, and with a decreasing plasma volume renal blood flow diminishes. The viscosity of the blood is increased as the proteins are concentrated; hydrostatic pressure becomes inadequate to form glomerular filtrate and formation of urine ceases. One or more days usually elapses before the appearance of anuria in untreated adults.

The treatment of dehydration is not as complicated as the recognition of the several chemical changes. Interstitial fluid has probably suffered the greatest volume change. This can best be restored by physiologic solution of sodium chloride. Such a solution contains relatively more chloride than does plasma or interstitial fluid, but, if the kidneys have not ceased functioning, any excess of chloride is excreted, leaving sodium to combine with carbon dioxide. Acidosis is thereby alleviated. Dextrose may be added to salt solution and is especially indicated if ketosis is present, but it should not be given initially in place of saline solution.

27. Thorn, G. W.; Engel, L. L., and Lewis, R. S.: The Effect of 17-hydroxycorticosterone and Related Adrenal Cortical Steroids on Sodium and Chloride Excretion, Science **94**: 2441, 1941.

28. Gamble, J. L.: Clinical Anatomy, Physiology and Pathology of Extracellular Fluid, Syllabus, Department of Pediatrics, Harvard Medical School, 1941.

29. Coombs, F. S.; Pecora, L. J.; Thorogood, E.; Consolazio, W. V., and Talbott, J. H.: Renal Function in Patients with Gout, J. Clin. Investigation **19**: 525, 1940.

Whole blood or plasma is indicated to restore colloid osmotic pressure if blood loss or starvation complicates the clinical state. Profound acidosis should be treated with alkaline solutions in spite of many prejudices which have appeared in the literature condemning them. No harm should result from their judicious use, and less of a burden is put on the kidneys for regulation of acid-base balance of the body. Sodium racemic lactate is very popular in American clinics and has largely replaced bicarbonate solution. One-sixth molar sodium lactate is isotonic and is made by adding one part of molar sodium lactate solution to five parts of sterile distilled water.[30] The approximate lactate requirements may be calculated if the level of bicarbonate in the blood is known. As an approximation, 10 cc. of solution per kilogram of body weight is required to raise the carbon dioxide content of the blood 10 volumes per cent. If dehydration is accompanied by alkalosis, saline solution usually suffices. The value of Ringer's and other complex solutions over physiologic solution of sodium chloride in adults is doubtful, although in infants and children replacement of calcium and potassium as well as sodium may be necessary. The intravenous route for parenteral therapy is to be preferred. Subcutaneous infusions are painful and usually unnecessary. Theoretically, parenteral therapy should continue until restoration of water and salt concentrations and restoration of body weight. Practically it is feasible to relax vigilance with partial restoration, and, once the vicious chain of events has been halted, the homeostatic processes of the body are able to act effectively.

30. Hartmann, A. F.: Theory and Practice of Parenteral Fluid Administration, J. A. M. A. **103**: 1349 (Nov. 3) 1934.

Council on Foods and Nutrition

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

FRANKLIN C. BING, Secretary.

THE COMPARATIVE NUTRITIONAL VALUE OF BUTTER AND OLEOMARGARINE

For many years the average annual per capita consumption of table fats in this country has been 20 pounds. During the past thirty years the per capita consumption of butter has varied from 13.9 to 18.7 pounds and oleomargarine from 1.1 to 3.4 pounds. These are average figures, and many people never consume oleomargarine while others may use mostly oleomargarine with little or no butter.

Regardless of the nutritional significance of these food products, we must admit that their consumption is based to a very large extent on custom, habit and income. No one food is indispensable in the diet, and we can cite many areas in the world where neither butter nor oleomargarine is consumed. In the United States, however, butter has been a favorite food through many generations. A large percentage of the early farm homes were equipped with churns in order to convert cream into butter, which was less perishable. The factory production of butter and oleomargarine is a more modern development.

The nutritionists are interested in adequate nutrition for all individuals. They are not concerned about what specific foods supply the essential nutrients, but they are interested in the possible ill effects of sudden shifts from one type of food to another. Butter has already been involved in one of these problems. The rapid increase in ophthalmia in Denmark in 1917 due to a sudden decrease in butter fat consumption, which has been so clearly described by Bloch,[1] is familiar to most of us. Owing to our increased knowledge of nutrition and the availability of concentrated food products, such sudden changes can be averted more easily today than ever before; but we must still be alert for new changes.

In light of these past experiences we are continually being asked whether an increased consumption of oleomargarine will have a detrimental effect on the health of our nation. A United States patent for making oleomargarine was issued in 1873. In 1886 an act of Congress legalized the manufacture of oleomargarine and placed a stamp tax of 2 cents a pound on all oleomargarine. The federal law has been changed six times by amendment. In 1902 the tax of 2 cents a pound was reduced to 0.25 cent on oleomargarine free from artificial coloration that causes it to look like butter of any shade of yellow. If artificial color was used to give the product a yellow color, the tax was 10 cents a pound. In 1931 this tax was changed to make all oleomargarine that was yellow subject to the 10 cent tax. At present every state except Arizona has some kind of oleomargarine legislation, but there is great variation among the states. Regardless of the motive behind many of these laws, it is very significant from a nutritional point of view that the federal government made it possible for the consumer to distinguish between butter and oleomargarine. In 1902 the importance of the distinction was not clear, but by 1913 it was evident that vegetable oils and many of the animal fats used in making oleomargarine were devoid of vitamin A, while butter was a rich source of this vitamin. Thus any substitution of oleomargarine for butter would directly decrease the vitamin A intake. However, today, as a result of the availability of vitamin A concentrates, it is possible to fortify the oleomargarine so that its vitamin A content may equal that of a high grade butter. At present about 85 per cent of the oleomargarine is fortified.

The kind of fat used in making oleomargarine has also changed during the past few years and will probably continue to change, depending on the availability of different oils. In 1933 coconut oil made up 75 per cent of the fat used, while last year it contributed 8.5 per cent of the materials used. About ten times as much cottonseed oil is used today as ten years ago, and soy bean oil now contributes about one third of the total oil used.

We should therefore give more detailed consideration to the possible differences in the nutritional value of butter and oleomargarine as they are produced today. Butter is "understood to mean the food product usually known as butter, and which is made exclusively from milk or cream or both, with or without common salt, and with or without additional coloring, and containing not less than 80 per cent by weight of milk fat, all tolerances having been allowed for." Oleomargarine is defined as a food made from either animal or vegetable fats or a combination of animal and vegetable fats. These fats are mixed with either cream, milk, skim milk or dried skim milk and water, or with some combinations of these. The finished product must contain not less than 80 per cent fat. In addition to these required ingredients the new standards adopted by the Food and Drug Administration, Sept. 6, 1941, permit the use of seven optional materials: (1) artificial color, (2) sodium benzoate or benzoic acid, (3) vitamin A with or without vitamin D, (4) diacetyl, (5) lecithin, (6) butter (no butter has been used in oleomargarine manufacture since 1935), (7) salt. The composition of a number of oleomargarines given in Accepted Foods, pages 42-43, shows that most of them contain from 80 to 82 per cent of fat.

In the light of modern nutritional knowledge, foods such as butter and oleomargarine may be of significance in the diet for the following reasons:

1. Concentrated form of energy.
2. Source of essential fatty acids.
3. Carrier of fat soluble vitamins.
4. Effect on requirement of other nutrients.
5. Source of possible unidentified factors.

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1. In order for these food products to exert any or all of these effects, the fat must be properly digested. There is no significant difference in the digestibility of butter and oleomargarine. Langworthy [2] has shown that most of the common fats are utilized to an extent of at least 93 to 98 per cent by the human body and can be tolerated in sufficient quantity to furnish 1,000 calories, or more than one third of the average daily energy consumption. Steenbock, Irwin and Weber, and Deuel and his co-workers have studied the rate of fat absorption in rats. Steenbock, Irwin and Weber [3] found butter oil, halibut liver oil and cod liver oil to be absorbed at a more rapid rate than lard, corn oil or partially hydrogenated fats, with butter falling between the two groups. They did not determine whether the rapidity of absorption was physiologically advantageous. Deuel and his co-workers [4] found no consistent difference in the rate of absorption of hydrogenated cottonseed oil, butter fat or coconut oil.

A gram of these fats yields 9.1 to 9.3 calories of heat or energy. While carbohydrates and part of the ingested proteins can also serve as a source of energy, the replacement of fat in the diet is limited. Starling [5] stated that "The question of bulk is probably one of the most important factors in determining the need for fat. The human alimentary canal has been developed so as to cope with a diet in which 20 to 25 per cent of the energy is presented in the form of fat." Further discussion of this question is made by Anderson and Williams.[6] Drummond recently reported to the Food and Nutrition Board of the National Research Council that the decreased fat intake in England was a serious question previous to the lend lease act. Thus the presence of appreciable amounts of fat (one fourth to one third of the total calories) in the American diet is an important factor.

Carlson [7] points out that the factor of palatability is of no small importance in insuring an intake of necessary types and amounts of food. Depending on previous habits, the use of butter or oleomargarine may have an important effect on the consumption of other foods.

2. It is well known that natural fats differ in the amount of unsaturated fatty acids present and that certain of the fatty acids appear to be essential in the nutrition of animals (Burr [8]). Careful exclusion of fat from the diet of rats leads to development of scaly skin, pronounced retardation of growth, kidney lesions, hematuria and early death. There are three unsaturated fatty acids, namely linoleic, linolenic and arachidonic acids, which are effective in preventing these symptoms, although the individual acids differ somewhat in their specific effects. Natural fats which are most effective in curing this disease are corn oil, linseed oil, olive oil and lard. Butter and coconut oil even at fairly high levels were not nearly as active in curing the condition. According to Eckstein,[9] butter may vary from 0.2 to 0.5 per cent of linoleic acid. Hilditch and Sleightholme [10] report the linoleic acid content of butter to be from 1.9 to 3.7 per cent. The linoleic acid content of oleomargarine will vary, of course, depending on the fats used in its manufacture, but it may be quite high if cottonseed oil is used in considerable amounts. The untreated cottonseed oil may contain 35 to 50 per cent of linoleic acid; however, the oil is usually hydrogenated, but even a hydrogenated cottonseed oil may contain 13 per cent of linoleic acid according to chemical assays (Hoagland and Snider [11]). On the basis of rat assays, Burr [12] has found approximately 2 to 5 per cent of linoleic acid in oleomargarine and 1 to 4 per cent in butter.

Even though butter fat is lower than the oleomargarines in the essential unsaturated acids, there is apparently sufficient present to meet the demands when whole mineralized milk is used as the sole article of diet. Rats have been maintained for long periods of time in excellent health on such a diet, and Anderson, Elvehjem and Gonce [13] have maintained dogs on such a diet for three years with the comment that the animals had very excellent fur coats. Infants, of course, have been maintained on milk diets for long periods of time. There may be a small amount of linoleic acid in the phospholipids of the skim milk, and the high lactose intake may have some sparing effect when whole milk diets are used. Some difficulty in rats has been reported when 9 per cent of butter fat has been used in synthetic diets as the sole source of fat, but this difficulty may be due in part to the development of rancidity in these purified rations, which would cause rapid destruction of the unsaturated fatty acids.

Some question has been raised about the importance of unsaturated fatty acids in human nutrition and it must be admitted that very little work has been done on human beings. Brown and his co-workers [14] kept two infants on a diet extremely low in fat and observed no symptoms except repeated mild attacks of impetigo. They did find a moderate decrease in the degree of unsaturation of the serum fatty acids. Hansen [15] has reported a similar decrease in infants suffering from severe eczema. Brown and his co-workers maintained an adult for a period of six months on a low fat diet which produced the typical fat deficiency syndrome in rats without demonstrable harm in the man. Linoleic and arachidonic acid contents of the blood serum did show a decrease. The highly unsaturated fatty acids should be provided in the diet of human beings, but it appears that for individuals on average diets no difficulty in this respect will be observed by shifting from butter to oleomargarine or vice versa.

3. Many fats are important carriers of the fat soluble vitamins; in fact, the original discovery of vitamin A was dependent on the use of fat poor experimental diets. Butter fat was used in many of these early studies and it was soon recognized that vegetable fats and many animal tissue fats were devoid of vitamin A. While butter fat has served as an important source of vitamin A in temperate zones, fish oils have played a similar role in arctic regions.

Most workers agree that many unfortified oleomargarines contain insignificant amounts of vitamin A. Some of the oleomargarines made from beef oleo oil may carry fair amounts of vitamin A. A significant portion of the oleomargarine is now fortified to an extent of 9,000 international units per pound. All the oleomargarine sold as a table fat should be fortified. The vitamin A content of butter is known to vary depending on the feed of the cow, but most of the butter produced in the dairy belt of the United States will contain 5,000 to 20,000 international units per pound. According to the values given by Dornbush, Peterson and Olson [16] the minimum value for winter produced butter fat is 3 micrograms of carotene and 7 micrograms of vitamin A per gram. The maximum value for summer produced butter fat is 10 micrograms of carotene and 13 micrograms of vitamin A per gram. Assuming that 1 pound of butter contains 378 Gm. of butter fat and that 1 international unit = 0.6 microgram of carotene and 0.3 microgram of vitamin A, the foregoing values give 10,584 to 22,200 international units per pound. In isolated areas where the feeding practices

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are very poor, values below 10,000 international units per pound may be obtained. There may be some loss of vitamin A in butter during storage, but fortified oleomargarine is also subject to this loss.

If we use the average per capita consumption of butter (17 pounds) and the average vitamin A potency as 12,000 international units per pound, butter can supply between 600 and 700 international units daily to each person in the United States. Many persons eat twice the average amount of butter and would therefore obtain one fourth of their total daily requirement from butter. It is obvious that only fortified oleomargarines and butter can be compared when the vitamin A is considered.

Butter contains from 50 to 500 international units of vitamin D per pound (Wilkinson[17]). Thus it is not a rich source, but a generous intake of butter may supply one sixth of the total requirement. Oleomargarine is practically devoid of vitamin D, although it may carry significant amounts if fish liver oils are used for the addition of vitamin A. In England both vitamins A and D are added to margarines. The Council accepts no special claims for the vitamin D added to oleomargarines in this country.

Butter is low in vitamin E, although there is sufficient in whole milk to allow reproduction in rats and dogs. Since the oils from seeds are rich sources of vitamin E, oleomargarine should carry appreciable amounts of this vitamin if the oleomargarines are properly prepared. No nutritional claims are recognized for vitamin E at the present time.

Although the vitamin K content of butter has not been determined accurately, it is obvious that butter contains relatively little of this vitamin. Oleomargarine also carries relatively little vitamin K, since the seeds of plants contain less vitamin K than do the leafy parts of the plant. Since the requirement for vitamin K may be satisfied by intestinal synthesis at least in adults, any difference in the amount of this vitamin in butter and oleomargarine is not of any great significance. In summary, then, butter supplies more vitamin A and vitamin D than oleomargarine unless it is fortified, and oleomargarine supplies more vitamin E than butter.

4. Evidence has been accumulating to show that the amount of fat in the diet may affect the body's requirement for other nutrients. In experimental animals the isocaloric replacement of sucrose with fat produces a significant decrease in the vitamin B_1 requirement. Natural fats such as butter, lard or corn oil all produce the same effect.[18] In the rat, high levels of fat appear to increase the riboflavin requirement, but again all fats function equally.[19] When animals are placed on a diet of skim milk fortified with minerals, a large percentage of the ingested galactose of the milk sugar is excreted in the urine.[20] When butter fat, lard, corn oil and coconut oil were added to the diet to the extent of 3 to 4 per cent, the loss of galactose in the urine was prevented.

The significance of choline in animal nutrition is now definitely established,[21] although its importance in human nutrition is not clear. At first thought one would expect the fats in the diet to supply much of the needed choline; however, purified fats have probably lost much of their phospholipid choline. Cereal products and skim milk, which carry little or no fat, supply much of the choline as well as other substances exerting a choline-like effect, needed in the diet.

In the rat, unsaturated fatty acids may have some sparing action on vitamin B_6; however, the significance of unsaturated fatty acids in human nutrition has already been discussed. According to present knowledge, then, the ingestion of butter or oleomargarine will not alter the requirement of other nutrients to any significant degree.

5. In studies designed to measure any possible difference in the nutritive value of butter and vegetable oils, Schantz, Elvehjem and Hart[22] showed that butter fat homogenized into raw skimmed milk with ample fat soluble vitamins and minerals added gave better growth when fed to weanling rats than did corn oil, coconut oil, cottonseed oil and soy bean oil fed in a like manner. The differences are most readily obtained in young growing rats and when the diet contains lactose. The factor responsible for the superior growth follows the saturated fraction of the butter fat.[23] The unsaturated fraction of butter fat is relatively rich in a compound which by hydrogenation may be converted to an active compound. Corn oil, coconut oil, cottonseed oil and soy bean oil apparently do not contain this compound, since hydrogenation of these vegetable oils does not improve their nutritive value when incorporated into skim milk.[24] That butter fat should have a different nutritional effect is not surprising, since several additional fatty acids have been isolated from butter fat (Hilditch[25]). Similar differences have been obtained by Gullickson and his co-workers[26] using calves as the experimental animal. They also found that the animal fats such as lard and tallow gave results similar to those obtained with butter fat. It is most interesting that some of the calves on a low fat diet made excellent gains and were healthy and thrifty. Thus the level of fat in the diet is very important in estimating the superior values of animal fats over vegetable fats. It is well known that rats grow very well on synthetic diets containing 2 per cent of corn oil. Euler and her co-workers[27] obtained better growth in rats on a purified diet containing oleomargarine than on a similar diet containing butter fat. The percentage of fats in their diet was also lower than that in whole milk, and the rate of growth in all their animals was rather low. It is possible that both rats and calves are able to synthesize additional fatty acids when they are on low fat diets.

Whether these results enter into the question of the relative value of butter and oleomargarine in human nutrition remains to be determined. Holt and his co-workers[28] have reported that soy bean oil is superior to butter fat in infant nutrition because the oil is more easily absorbed than butter fat. At present it is unknown whether the factors indicated to be essential in the animal experiments are needed by human beings. If they are needed they are probably more important in growing children than in adults. If they must be supplied in the diet, the other ingredients of the diversified diet consumed by most adults will probably supply sufficient amounts of the factor. Many of the oleomargarines now manufactured contain some animal fats in addition to the vegetable oils. These animal fats should supply the same factors that are present in butter fat.

It is therefore possible to conclude that at present there is no scientific evidence to show that the use of fortified oleomargarine in an average adult diet would lead to nutritional difficulties. A similar statement is probably justified in the case of growing children, but preliminary results from animal experiments indicate that more work is necessary before any specific conclusions can be made. Since the nutritional factors have not all been identified, and since butter contains numerous additional fatty acids of unknown nutritional significance, the consuming public has a right to demand that the practice of identifying oleomargarine and butter so that any one can differentiate between them should be continued.

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SATURDAY, AUGUST 22, 1942

EPIDEMIOLOGY OF LYMPHOCYTIC CHORIOMENINGITIS

Although occasional references appear in older medical writings to an acute aseptic meningitis, Wallgren in 1925 first described a small epidemic in Sweden of what is now called lymphocytic choriomeningitis in which the probable nonbacterial infectious nature was recognized. The causative virus was isolated by Armstrong and Lillie [1] from a patient with atypical fatal meningitis during the St. Louis epidemic. This virus differed from the ordinary encephalitis virus principally involved in that epidemic. Injected into mice or monkeys, the new virus gave rise to a fatal lymphocytic infiltration of the choriomeningeal tissues with minor involvement of the lungs. Later an apparently identical virus was isolated by Rivers and Scott [2] from 2 other patients with fatal nonbacterial meningitis and by Findlay, Alcock and Stern [3] from the cerebrospinal fluid of 2 patients who survived. Traub [4] at about the same time demonstrated the existence of an endemic in a colony of apparently normal mice apparently due to the same virus. Evidence that infected house mice are the probable source of the human infection was presented by Armstrong, Wallace and Ross,[5] who recovered the virus from mice trapped in the homes of 5 persons who had the disease. There were no human cases in neighboring mouse free homes or in homes which harbored noninfected mice. Dogs and rhesus monkeys may also serve as natural reservoirs for this disease.

Traub estimates on the results of serologic studies that 50 per cent of all members of a mouse colony may be infected, with a mortality of about 2 per cent. The majority of the naturally infected mice show no definite symptoms, the presence of the virus being determined by inoculating their blood or brain emulsions into normal guinea pigs. Disease free mice may be infected by placing them in contact with mice which have this subclinical or latent disease. Nearly 100 per cent of all mice from noninfected stock develop recognizable symptoms in from five to twelve days after intracerebral inoculation. As the disease progresses, tremors and spastic convulsions of the hind legs are noted, practically all mice dying in convulsions from one to two days after the onset of recognizable symptoms. At necropsy the brain appears hyperemic. Microscopically the meningeal infiltration is mainly with lymphocytes, with an occasional plasma cell or polymorphonuclear leukocyte. Areas of discoloration and consolidation are seen in the lungs. According to Rivers, this interstitial bronchopneumonia is similar to that caused by other viruses.

The virus is readily identified by specific neutralizing tests with convalescent human serum. By such neutralization tests it has been shown that the virus is excreted in the urine and nasal secretions. The disease is readily transmitted by nasal instillation, by instillation into the urethra or vagina of monkeys,[6] by application of infectious material to slightly scarified skin surfaces, and even to the unscarified skin of guinea pigs.[7] The virus is apparently transmitted through the normal placenta, the majority of the mice of certain colonies being infected in utero. After subcutaneous inoculation the virus may be detected within twenty-four hours in the blood stream, increasing to a maximum by the fifth day. The virus persists in the circulation till the death of the animal or for several weeks or months after convalescence in nonfatal cases. The prompt appearance and persistence of this virus in the blood stream offers almost ideal conditions for its transmission by blood sucking insects.

Major efforts to determine the vector have revolved around the common blood sucking insects. Thus, three years ago Coggeshall [8] announced the successful transmission of the virus from guinea pig to guinea pig through the bite of one species of mosquitoes (Aedes aegypti). In his experiments these mosquitoes were capable of transmitting the infection as early as the fourth day after feeding on an infected animal and as late as the fifteenth day. Milzer,[9] however, obtained negative results with two other species of mosquitoes (Culex pipiens and Aedes albopictus), and with Aedes aegypti kept at room temperature. Transmission was readily effected by Aedes aegypti; however, between the seventh and the twenty-first day after feeding on an infected guinea pig, provided this species was kept at temperatures varying from 28 to 32 C. (82.4 to 89.6 F.). In 1 case

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a mosquito incubated at the optimum temperature of 30 C. (86 F.) was able to infect guinea pigs as late as thirty-eight days after feeding on an infected host. These results correspond with those reported by previous investigators on the effects of extrinsic temperature on aegypti transmission of yellow fever and on the development of the sexual cycle of human malarial parasites in Anopheles. Milzer concludes from this evidence that, "because of the relatively high temperatures necessary for infection, Aedes aegypti would probably not be a vector of any importance" in the natural spread of lymphocytic choriomeningitis.

Milzer also tested the vector potentiality of the rhesus louse (Eupedicinus longiceps) and of certain blood sucking mites (Atricholaelaps glasgowi). The virus can be demonstrated in lice twenty-four hours after feeding on an infected monkey. Three hundred presumably infected lice, transferred to the back of a normal monkey, however, did not produce a virus infection. The virus survives for at least twenty-five days in blood sucking mites kept at room temperature, but attempts to transmit the disease by the uncontrolled feeding of infected mites also gave negative results. Two mice and 2 guinea pigs were each forced to swallow a gelatin capsule containing 20 living infected mites. All four animals developed typical choriomeningitis on the seventh day after this infected meal.

Somewhat more striking results were obtained with bedbugs (Cimex lectularius). Two methods of infection are conceivable with these insects, a direct infection by the mouth parts and an indirect infection through deposit of feces on the skin, bedbugs habitually defecating at the time of biting. Successful transmission to a normal guinea pig was effected in eleven out of eighteen attempts in which fecal contamination was not prevented. Male and female bedbugs as well as first stage larvae gave positive results. Under conditions that exclude fecal contamination, however, the virus may be transmitted by the mouth parts ten minutes after feeding on an infected guinea pig; negative results are obtained twenty-four hours or more after such feeding.

Control experiments showed that the virus is usually present in infectious concentration in dried feces collected from infected bedbugs as late as eighty-five days after an infectious feeding. The feces are obtained by saline washings of test tubes in which the bugs are stored or from strips of sterile filter paper on which the bedbugs have defecated. Such feces are able to infect guinea pigs if applied to the lightly scarified skin. The virus persists in the intestinal tract of bedbugs through molting from the first to the second larval stage but has not yet been detected after the second molting. Hereditary transmission of the virus has not been demonstrated. Eggs hatched under conditions that prevent fecal contamination resulted in virus free larvae. Attempts to transmit the virus by swallowing gelatin capsules containing 5 to 6 infected bedbugs also gave negative results in both mice and guinea pigs. Cage to cage transmission was effected by using bedbug infected cages but gave negative results in bedbug free cages.

This work suggests that the bedbug is the major vector in the natural epidemiology of lymphocytic choriomeningitis, a conclusion which is all the more striking in view of the common belief that "bedbugs have not been definitely incriminated as important natural vectors of any disease."[10] Furthermore, Milzer's demonstration that mosquito transmission of this disease is possible only under a narrow temperature range suggests the desirability of repeating transmission experiments with poliomyelitis and other viruses under carefully controlled temperature conditions.

STUDIES WITH RADIOACTIVE IRON

The suggestion has been made that the production of radioactive isotopes by physicists and the concentration of naturally occurring isotopes by chemists have provided what may in the final analysis prove to be the "Rosetta stone" for the elucidation of metabolic processes of the organism. The isotopes are readily recognizable, tagged elements that apparently behave exactly like their common prototypes in the body. The radioactive isotope of iron, which has the comparatively long half life of forty-seven days, has proved to be a particularly valuable tool in biologic researches, and its use has amplified our understanding of the metabolism of iron. The informative experiments of Hahn and his co-workers on the absorption, transportation and utilization of radioactive iron have been discussed in THE JOURNAL.[1] Studies with tagged iron permitted the surprising observation that the need of the organism for iron in dogs in some manner determines the absorption of this element, absorption being appreciable in anemic dogs but only slight in normal dogs.[2] Hahn and his associates have continued their work with radioactive iron and have made additional contributions to our knowledge of iron metabolism.

Recently, suggestive experiments on the fate of the iron from destroyed red cells were carried out by these investigators.[3] Blood destruction in dogs was produced with acetylphenylhydrazine, and it was found that the iron liberated from the erythrocytes was utilized nearly quantitatively in the regeneration of new red cells during the period of spontaneous recovery

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from the anemia. Thus the animal organism appears to be highly efficient in conserving the iron of the blood. In studies on normal dogs with an ample reserve supply of iron it was observed, moreover, that the hemoglobin iron of new red blood corpuscles derived largely from the iron of old red cells which are broken down in the normal wear and tear, rather than from reserve stores. When hemoglobin is regenerated in an iron deficient, anemic dog following a single oral administration of the radioactive isotope, the age of the red cells into which the pigment is built can be considered as known to within a few days.[4] On the contrary, when disintegration of erythrocytes occurs either by aging or by trauma, reutilization by new cells of the labeled iron from the liberated hemoglobin is such that the total circulating radioactivity is maintained constant. It is therefore not feasible to use the iron isotope in the determination of the life cycle of the red cell.[5] Further studies with radioactive iron will undoubtedly help to elucidate more fully the metabolic processes in which iron is involved. The employment of radioactive isotopes, including radio iron, in biologic investigations provides another example of the recent contributions of physics to medicine, for it is the cyclotron of the physicist which makes possible the tagging of elements.

Current Comment

MOSQUITOES AND ENCEPHALITIS IN THE YAKIMA VALLEY

In a series of recent studies by Hammon, Reeves and their colleagues [1] much new information has been made available on the transmission of encephalitis in the Yakima Valley. In a four month period during the summer of 1941 over 15,000 living arthropods were collected, frozen and inoculated into laboratory animals for the purpose of isolating the encephalitis virus. Over 12,000 of these were mosquitoes. From Culex tarsalis Coquillett three strains of St. Louis encephalitis virus and five strains of western equine encephalomyelitis virus were isolated. Virus was not isolated from other species of mosquitoes. For the isolation of either the western equine or the St. Louis virus intracerebral inoculation of 5 Swiss mice of a suitable strain was proved by comparative tests to be more satisfactory than intracerebral inoculation of one 200 Gm. guinea pig or two 8 to 12 day chick embryos. By means of precipitin tests it was demonstrated that C. tarsalis feeds in nature on cows, horses, man, pigs, dogs, chickens (other birds?) and sheep. Since C. tarsalis has been shown to be an efficient vector of western equine and St. Louis viruses, this widespread feeding makes it possible for the species to spread the infection among many animals and birds. In the course of these investigations an efficient trap for collecting live mosquitoes was developed. Finally the investigators summarize the evidence against Culex tarsalis and conclude that it is the most important vector of western equine and St. Louis encephalitis viruses in the Yakima Valley. Its possible role elsewhere is wisely left to be judged on the basis of local observations.

JAUNDICE IN WEST AFRICA NOT DUE TO YELLOW FEVER

The clinical diagnosis of yellow fever is often difficult. For the purposes of histologic diagnosis a routine procedure of frozen and paraffin sections of the liver is followed in the Medical Research Institute at Lagos, Nigeria. Smith [1] now presents notes and reports of microscopic examination of the liver in 14 cases in which an obscure clinical picture and a variety of hepatic changes occurred. In all there was unexplained jaundice. In none of the cases described was it possible to elicit a possible causative factor. The microscopic changes in the liver resembled those of subacute yellow atrophy or necrosis in 6 of the cases. Extensive Councilman necrosis was present in 2 and calcified casts in 2. Smith concludes that there are various conditions which, from the changes brought about in the liver, may cause confusion in the clinical diagnosis of yellow fever. The evidence clearly suggests that there are one or more conditions occurring in these African natives which resemble yellow fever but are not due to the same causative virus.

BIBLIOGRAPHY OF AVIATION MEDICINE

The performance of modern combat airplanes has so seriously taxed the physiology of the flight personnel that a new field of study has arisen which, for want of a better term, has been designated "aviation medicine." The literature already has become vast and it cuts across not only medicine itself but many phases of biologic, physical and chemical sciences. Now an extensive bibliography in this field has been collected and classified by Hoff and Fulton.[1] The classification has been carefully devised and the references can be approached satisfactorily either through the table of contents or through the index of subjects. There is also an index of authors. This compilation is invaluable for any one engaged in research in the field of aviation medicine.

4. Cruz, W. O.; Hahn, P. F.; Bale, W. F., and Balfour, W. M.: The Effect of Aging on the Susceptibility of the Erythrocyte to Hypotonic Salt Solutions: Radioactive Iron as a Means of Tagging the Red Blood Cell.

5. Hahn, P. F.; Bale, W. F., and Balfour, W. M.: Radioactive Iron Used to Study Red Blood Cells Over Long Periods, Am. J. Physiol. **135:** 600 (Feb.) 1942.

1. Hammon, W. McD.; Reeves, W. C.; Brookman, B., and Izumi, E. M.: Mosquitoes and Encephalitis in the Yakima Valley, Washington: Arthropods Tested and Recovery of Western Equine and St. Louis Viruses from Culex Tarsalis Coquillett. Hammon, W. McD.; Reeves, W. C., and Izumi, E. M.: Methods for Collecting Arthropods and for Isolating Western Equine and St. Louis Viruses. Bang, Frederik, and Reeves, W. C.: Feeding Habits of Culex Tarsalis Coq.: A Mosquito Host of the Viruses of Western Equine and St. Louis Encephalitis. Reeves, W. C., and Hammon, W. McD.: A Trap for Collecting Live Mosquitoes. Hammon, W. McD.; Reeves, W. C.; Brookman, B., and Gjullin, C. M.: Summary of Case Against Culex Tarsalis Coquillett as a Vector of the St. Louis and Western Equine Viruses, J. Infect. Dis. **70:** 263 (May-June) 1942.

1. Smith, E. C.: Hepatic Findings Excluding Yellow Fever in Fourteen Cases of Jaundice in West Africa, Ann. Trop. Med. **36:** 38 (June 30) 1942.

1. Hoff, Ebbe Curtis, and Fulton, John Farquhar: A Bibliography of Aviation Medicine, Springfield, Ill., Charles C Thomas.

"AEQUANIMITAS" IN SPANISH

Among the classics in American medical writing is "Aequanimitas" by Sir William Osler. As a friendly gesture toward our South American colleagues, Eli Lilly & Company has had a translation of this work made by Dr. Arístides A. Moll, secretary of the Pan American Sanitary Union. A copy of the Spanish edition is being sent on graduation to the graduates of all South American medical schools. A letter which accompanies the presentation expresses the hope that the newly graduated physicians will appreciate and share Sir William Osler's inspiration, his breadth of vision and, above all, his persistent research for truth. The presentation is particularly apropos because this volume contains the magnificent essay entitled "Chauvinism in Medicine," which is a condemnation of all that chauvinism means in inhibiting medical progress.

FATAL COLLAPSE ASSOCIATED WITH PHYSICAL EXERTION

Acute fatal nontraumatic collapse during indulgence in athletic sport or other strenuous exertion may occur with or without previous signs. An analysis by Jokl and Suzman [1] of Johannesburg of 66 cases of sudden death in which clinical data and complete necropsy reports were available indicates the not unexpected conclusion that collapse associated with exertion is almost invariably due to circulatory disease of long duration. The following conditions arranged in order of frequency were found at necropsy: coronary artery disease, acute coronary occlusion, degenerative disease of the heart muscle, ruptured aneurysm of the aorta, chronic inflammatory disease of the heart muscle, ruptured aneurysm of the cerebral arteries, rupture of the heart, rupture of a congenitally diseased aorta, developmental abnormalities of the heart and developmental hypoplasia of the entire arterial system. They point out that arterial blood pressure rises physiologically during exercise and drops below the initial level during the rest period following exertion. In the cases studied, whenever the necropsy revealed that death had been due to rupture of diseased blood vessels the first symptoms of the collapse preceding death had set in during muscular effort. During the negative phase after exertion, when the arterial pressure drops lower than the initial level, there is distinct danger to those who suffer from coronary and myocardial disease. In this group was a football player who lost consciousness after a game and died thirty minutes later. The authors believe that expiratory effort with a closed glottis represents the greatest physical stress with which the heart has to cope. The diffusion of oxygen through the lung is virtually suspended, and oxygen saturation of the capillary blood consequently decreases rapidly. The ultimate result is a pressure gradient apparently measured, as far as the coronary system is concerned, by the difference in pressure between the aorta and the coronary sinus and right ventricle. In subjects with coronary artery disease and deficient capillary supply of a hypertrophic myocardium, the physiologic phase often represents a catastrophic event from which the heart may never recover. The authors discuss a gastrocoronary reflex often present in strenuous exertion involving rise of intragastric pressure probably in the proximal portion of the stomach which, it is claimed, elicits a reflex constriction of the coronary artery circulation. They conclude from this and other work that any functional strain conceivable cannot cause fatal collapse but that certain diseases such as those enumerated render the heart and blood vessels so vulnerable that the physiologic effort associated with physical exertion may overtax their adaptive plasticity.

1. Jokl, E., and Suzman, M. M.: Mechanisms Involved in Acute Fatal Nontraumatic Collapse Associated with Physical Exertion, Am. Heart J. **23**: 761 (June) 1942.

CHEST INJURY AND CORONARY OCCLUSION

The question as to whether or not direct nonpenetrating injury of the chest can damage the heart or produce acute coronary thrombosis has received comparatively little study.[1] In a recent examination of this subject Leinoff [2] presents 17 cases involving trauma to the chest followed by symptoms of acute cardiac damage. The injury was considered an important etiologic factor in the first 15 cases and only incidental in the last 2. The clinical picture in these cases is that of an acute pathologic condition of the heart closely resembling coronary occlusion, from which, however, it may be differentiated by the history of trauma. The history is the most important single factor in determining the causal relation and the subsequent degree of disability. Electrocardiographic changes, however, are definite and important and usually show changes associated with acute cardiac lesions. Leinoff concludes that direct nonpenetrating injury of the chest can produce nonfatal disabling heart damage and that the resulting characteristic clinical syndrome should be considered in the presence of any injury of the chest.

1. Sigler, L. H.: Trauma of the Heart Due to Nonpenetrating Chest Injuries, J. A. M. A. **119**: 855 (July 11) 1942.
2. Leinoff, H. D.: Acute Coronary Thrombosis in Industry, Arch. Int. Med. **70**: 33 (July) 1942.

MENTAL CONFUSION FROM THE SULFONAMIDES

THE JOURNAL previously has called attention editorially to the danger of impaired judgment which sometimes results from sulfanilamide administration.[1] Now the Committee on Disability and Rehabilitation of the Medical and Surgical Section of the Association of American Railroads [2] reemphasizes this hazard. Investigation reveals, this report states, that there is frequently a period of confusion following administration of any of the sulfonamide group of drugs. Hence it is recommended that a patient, after receiving treatment of this type, should be free from work for seven to fourteen days following such administration before being permitted to resume duties in either engine or train service. The possibility of serious mental confusion must be borne in mind especially for those whose activities under circumstances of impaired judgment would be particularly hazardous to others. This would include many occupations in civil life and practically all those in military fields.

1. Impaired Judgment from Sulfanilamide, Current Comment, J. A. M. A. **116**: 2279 (May 17) 1941.
2. Report of Committee on Disability and Rehabilitation, Medical and Surgical Section, Association of American Railroads, J. R. Garner, M.D., Chairman, Circular M. & S. 239, May 1, 1942.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

PRESENT STATUS OF PROVISION AND SUPPLY OF PHYSICIANS

Frank H. Lahey, Chairman
For the Directing Board

Many thousands of medical officers have taken their oaths of office or are now in the process of being commissioned in the Army and Navy. Additional thousands of physicians under 37 years of age have been cleared by the professional and state committees for service in the Army and Navy. In some states, quotas developed by the Procurement and Assignment Service have been filled. However, with the rapid expansion of the armed forces planned during the next six months and with the growth of the military medical services, many additional thousands of medical officers will be required.

Some reduction in the number of medical officers per thousand troops is anticipated because the Army has changed its tables of organization, so that officers in the Medical Administrative Corps will be assigned to administrative positions formerly held by medically trained men.

ENROLMENT

By June 1 a hundred and thirty thousand enrolment forms and questionnaires had been returned by physicians. Although many thousands indicated that a commission in the armed forces was their first choice, relatively few applications for commissions in the medical corps of the several services had been received. This seems to have been due to a misunderstanding; namely, that enrolment with the Procurement and Assignment Service was equivalent to applying for a commission. Furthermore, lack of personnel and equipment delayed entering the data of the questionnaires on punch cards. All the information has now been coded on the punch cards. Obviously, every physician should enroll with the Procurement and Assignment Service. If the physician is enrolled, he will be benefited by receiving proper consideration from his Selective Service board, and the state chairman of the Procurement and Assignment Service will be aided in arriving at a decision as to occupational deferment and in rating a physician or dentist as available or essential.

All physicians who failed to enroll and file questionnaires are now being listed. This will be done with the aid of the National Roster and of the American Medical Association. If you have not yet filled out an enrolment form and questionnaire, you should, for your own benefit if not for proper service to your nation, *fill out the enrolment form and questionnaire at once.* If you do not have a blank form, request one immediately from the National Roster of Scientific and Specialized Personnel, 1006 U Street N.W., Washington, D. C.

THE RECRUITMENT OF PHYSICIANS

On April 18 the President issued an executive order transferring the functions of the Procurement and Assignment Service to the War Manpower Commission in the Office for Emergency Management. Previous to this the Navy established offices of Naval Officer Procurement in all naval districts throughout the United States for the most rapid processing of applications and the procurement of officers.

During the latter half of May, terms of army officers constituting medical officer recruiting boards were sent by the War Department to various states to stimulate and facilitate the recruiting of medical and dental officers for the Army. These boards are authorized to issue commissions to qualified applicants immediately. The weekly number of appointments rose sharply. Since the members of the recruiting boards are getting in contact only with those physicians and dentists who have been "cleared" by the Procurement and Assignment Service, there has been a greatly increased volume of work in this agency. To handle this additional work, the office personnel of the Procurement and Assignment Service was increased, and on July 2 its offices were moved to 1006 U Street, N.W., along with those of other divisions of the War Manpower Commission, including the National Roster of Scientific and Specialized Personnel.

With these increased facilities, proper functioning became possible. By the middle of July letters had been forwarded to fifteen hundred physicians under 37 years of age who had signified their preference to serve with the Army. Each letter contained a postcard addressed to the Surgeon General of the Army and one addressed to the War Manpower Commission, and the physician was asked to sign and forward them, thus indicating his desire to be commissioned. The sending of these letters will be continued. To expedite matters, the recruiting unit in each state is informed by the Office of the Surgeon General of the applicant's willingness to apply for a commission.

The Navy Department is furnished names by the Procurement and Assignment Service of those physicians who signify a preference for the Navy. The Bureau of Medicine and Surgery sends such physicians invitations to enroll in the Medical Corps of the United States Naval Reserve and indicates to them how they may apply according to Navy regulations. Physicians should realize that they still have freedom of choice as to the armed service to which they prefer to apply for commission. It is to be borne in mind that the Selective Service boards alone have the legal authority to draft physicians. These boards have been instructed to give every consideration to the physicians whose numbers have been called.

Thus the Procurement and Assignment Service is now functioning according to the plans originally established by the directing board and by the various committees. Its purpose, however, includes not only the listing and procurement of medical, dental and veterinary personnel for the armed forces but also the procurement and equitable allocation of medical and allied personnel for civilian service in medical schools, hospitals, industry, nonmilitary governmental agencies and civilian communities.

NEEDS OF THE CIVILIAN POPULATION

One of the first steps taken by the directing board of the Procurement and Assignment Service was the establishment of a study of the distribution of physicians in each of the states according to age, sex and type of practice, in relation to population. These data were utilized in meeting the needs of the armed forces, due allowance being made for the differences between states. Furthermore, the medical needs of districts in each state were roughly estimated, on the basis of one physician for each 1,500 of population. These figures are

employed in determining the number of physicians to be judged "essential" in any given area. The status of individual physicians, not only in private practice, but also in hospitals, medical schools, industry and various governmental institutions, was determined only after the local authorities had been consulted, and the final decision was always left to the state committees or, in the case of dispute, to the corps area committees.

Unfortunate incidents have arisen through the commissioning of men previously declared "available" who have suddenly become "essential" because of the death, disability or enlistment of some other physician. In such cases nothing can be done by the Procurement and Assignment Service if the oath of office has been administered. However, the Navy has revoked the commissions in instances in which the withdrawal of a physician from his community was not obviously to the best interests of the general defense program. Many difficult situations have been created by the volunteering of men listed as "essential." Such a physician is just as important to the war effort as a medical officer; he should not apply for a commission unless he is certain that some one is available to take his place. In fact, in this country, as in England, the armed forces have agreed to refuse a commission to a physician or dentist so designated. The Navy likewise is doing this.

RESERVE OFFICERS

All reserve officers of the Army are now subject to call to active duty, even though they have been declared "essential"; such men were granted permission to resign prior to July 1, 1942. All reserve officers of the Navy, except interns, are placed on active duty within a month after obtaining their commissions.

MEDICAL SERVICES FOR INDUSTRIAL COMMUNITIES

Medical services must be provided for new or rapidly expanding industrial communities. This is essentially a local problem, but, if physicians are not available, men who are physically unfit or too old for military service, and who are willing to be dislocated, must be assigned to such positions. This is a problem to which the directing board of the Procurement and Assignment Service is now giving special consideration so that suitable recommendations may be sent to the War Manpower Commission.

ADDITIONAL PROBLEMS

1. A suitable pool of physicians, including specialists, must be established from which the armed forces can draw for men with general and special training and for future needs.

2. The headquarters of Procurement and Assignment Service, now well organized and located with the National Roster of Scientific and Specialized Personnel at 1006 U Street N.W., Washington, D. C., proposes to maintain up to date information concerning each physician, dentist and veterinarian in the United States, his assignment and his availability.

3. Consideration is being given to the utilization of the physicians who have graduated from unapproved medical schools and of citizens of co-belligerent countries, of enemy countries and of enemy occupied countries.

NUTGALLS AND TANNIC ACID U. S. P.

Because the fulfilment of requirements for the defense of the United States has created a shortage in the supply of nutgalls and tannic acid U. S. P., order M-204 has been issued by the War Production Board to establish control of these agents. Nutgalls are defined as the excrescences or galls obtained from the young twigs of Quercus infectoria Olivier and other allied species of Quercus (Fam. Fagaceae) or from the leaves of Rhus semialata Murray or R javanica L, tannic acid U. S. P. as gallotannic acid or so-called tannin meeting U. S. P. requirements.

Essentially the general restrictions provide that no person shall process, combine with other materials or use any nutgalls except for the maximum production of tannic acid U. S. P. or use any tannic acid U. S. P. except for the treatment of burns or for the manufacture of a product to be used exclusively for the treatment of burns or as an analytic agent for use in analytic control in research laboratories or as an antidote for internal administration in the treatment of poisoning or in the extemporaneous compounding by licensed pharmacists of individual prescriptions of licensed physicians, dentists or veterinarians or in the extemporaneous compounding of medicines by licensed physicians, dentists or veterinarians for their own patients. No person shall sell, transfer or deliver or purchase or accept transfer or delivery of any nutgalls or tannic acid U. S. P. which he knows, or has reason to believe, is to be processed, combined with other materials or used for purposes other than those permitted by the preceding exemptions. Further, purchasers must sign a certification that nutgalls or the acid will be used only for permitted purposes. The restrictions will not apply to any stock of nutgalls amounting to less than 5 pounds, nor will it apply to nutgalls or tannic acid U. S. P. which has been combined with any other material before issuance of the order. It will not apply to the householder who uses the U. S. P. acid for his own medicinal purposes, but the person who sells to the householder must observe the prescribed restrictions.

All persons possessing or having control of stocks of nutgalls amounting to 5 pounds or more at any one place or of tannic acid U. S. P. amounting to 2 pounds or more must file a report with the War Production Board on form PD-623 before Aug. 31, 1942. Any person affected by this order who considers that compliance therewith would work an exceptional or unreasonable hardship on him may appeal to the War Production Board. All reports and communications concerning this order should be addressed to War Production Board, Health Supplies Branch, Washington, D. C., reference M-204. Wilful violation of the order may result in punishment by fine or imprisonment, in addition to that individual being prohibited from making or obtaining further deliveries.

A recent release from the Office of War Information, War Production Board, asserts that Health Supplies Branch officials believe that there are adequate substitutes, including tannic acid, technical grade, available for the industrial and medicinal purposes for which tannic acid U. S. P. is now prohibited. Nutgalls, which develop on certain species of shrubs, are normally obtained from China, Turkey, Syria, Iran and Iraq. Obviously, only comparatively small amounts now can be expected from these sources. Although there are other possible raw material sources of tannic acid, such as tara, sumac, divi-divi and other shrubs found in the Western Hemisphere, it is not believed that any substantial amounts of tannic acid meeting U. S. P. requirements can be obtained from such sources at this time. Order M-204 is expected to conserve approximately half the former civilian consumption of the U. S. P. acid.

SURVEY OF NEW JERSEY HOSPITAL FACILITIES FOR EMERGENCIES

The Office of Civilian Defense director of the state of New Jersey has surveyed the public hospitals in the state which are available for emergency services. Of these there are eighty-nine general hospitals with a total emergency bed capacity of about 20,000, nine state and county mental disease hospitals with 16,000 beds, fourteen state and county tuberculosis sanatoriums with 4,300 beds, eight county and local isolation hospitals with 1,500 beds, and a veterans hospital for mental patients with 1,750 beds; additional hospitals which might be considered available for emergency services are the proprietary hospitals and the nursing and convalescent homes.

The state hospital officer has classified the public hospitals with regard to vulnerability into four classes: 1. Maximum vulnerability. Use as casualty hospital only. These hospitals are in metropolitan centers or serve key defense areas likely to become objectives of attack. 2. High vulnerability. Use as casualty hospital only. These are hospitals in suburban and some urban communities offering slightly less significance as military objectives than those served by class 1 hospitals. 3. Low vulnerability. Use as emergency base hospital. These

are hospitals in rural or semirural areas where the probability of attack is relatively unlikely. 4. Minimum vulnerability. Use as emergency base hospital. These are hospitals in rural and protected areas believed to offer the greatest relative safety as emergency base hospitals possible within the state.

The Office of Civilian Defense director of New Jersey states that of the general hospitals thirty-three are in areas of maximum vulnerability, thirty-eight in areas of high vulnerability and nine each in areas of low and minimum vulnerability, respectively. According to the present plans of federal authorities, there would be two types of hospitals, functioning in the emergency: (1) casualty receiving hospitals, which would care for casualties occurring near the area in which the hospital is located, and (2) emergency base hospitals located in rural and safe areas to which patients needing prolonged hospital care would be evacuated. The emergency base hospitals will include existing new or improvised facilities. All hospitals in the nation, voluntary or governmental, may serve as casualty hospitals of the Emergency Medical Services established by the Office of Civilian Defense for the care of civilian casualties caused by enemy action. This plan will not affect the management or control of such hospitals. Cash payments will be given to them for caring for casualties pursuant to the President's order at a rate of $3.75 a day.

The State Hospital Officer and the Emergency Medical Service are responsible for determining in collaboration with the local military and state evacuation hospitals, the plans of evacuation and means of transport of civilian casualties from local casualty receiving hospitals to emergency base hospitals. Evacuation plans must be coordinated with plans made for the evacuation of the general population and with the restrictions placed on the use of highways, making necessary the routing of casualities over secondary highways.

Central administrative units (control centers) are being organized to cover the various districts in New Jersey in order to integrate the activities of the various protective services, including hospital services. The district control center will direct rescue squads and emergency medical field units to the scene of the incident. Following emergency care at the scene, casualties will be dispatched to hospitals designated by the control center. When all the hospitals within a district are full of patients, the district control center will notify the main control center, which will direct that additional casualties be routed to public hospitals in some other district.

Emergency base hospitals may require a large staff of physicians and dentists, and since a well balanced technical staff cannot be assembled hurriedly, according to the Office of Civilian Defense director, it is proposed to expand the commissioned reserve of the United States Public Health Service for this purpose. Recruiting will be carried on in collaboration with the Procurement and Assignment Service largely from the older age groups, from physicians with minor physical disabilities which make them ineligible for military service, and from women physicians. The U. S. Public Health Service and the Medical Division of the Office of Civilian Defense will cooperate with the American Red Cross, responsible state and local officials and other organizations in arranging for nursing, technical and other services in emergency base hospitals.

GRADUATION AT CARLISLE BARRACKS

Another field training course at the Medical Field Service School, Carlisle Barracks, Pa., was completed on July 1 with the graduation of one hundred and seventy-nine officers of the medical department, representing thirty-four states. The subjects taught included field medicine, military sanitation, military art, logistics, administration and training. The graduation ceremony was held in the War Department theater and the diplomas were presented by Brig. Gen. Addison D. Davis, commandant of the school. These classes are designed to give graduates in medicine, dentistry and veterinary medicine training for military duties in the field. After the ceremony the graduates left immediately to join their units. The class comprised one hundred and ten medical corps officers, sixty-one of the dental corps, four of the veterinary corps, two of the sanitary corps and two of the medical administrative corps.

FEDERAL AID FOR SCHOOLS OF NURSING

Schools of nursing have been asked to admit 55,000 students during the current school year, which is an increase of 10,000 over last year's admissions.

An appropriation of $3,500,000 has been made by the Congress for the training for nurses (national defense). The schools of nursing throughout the country have been notified regarding the availability of these funds, and the schools are urged to participate in this program.

Funds are allotted by the Public Health Service directly to eligible schools. Schools unable to increase their admissions over the school year 1940-1941 may request scholarship tuitions for qualified students. The goal is that no qualified student be barred from entering a school of nursing because of lack of funds. Funds are available for students unable to meet costs from other sources.

Schools that are able to increase their admissions over the school year 1940-1941 may request funds for scholarship tuitions and in addition for the following purposes:

1. Additional instructors and instructional facilities commensurate with increased student admissions.
2. Subsistence during that portion of the program when the student is not rendering any appreciable service to the institution.
3. Expansion of clinical experience through affiliation with other institutions.

A previous announcement outlined the objectives of the program and the purposes for which these funds might be used.

For further information, schools may write to the U. S. Public Health Service, Washington, D. C., Bethesda Station.

NUTRITION ADVISORY SERVICE ORGANIZED

An industrial nutrition advisory service has been organized under the direction of Dr. W. H. Sebrell Jr., director, division of chemotherapy, U. S. Public Health Service, and M. L. Wilson, assistant administrator, Office of Defense Health and Welfare Services. The new service will provide practical recommendations to both government owned plants and private industries to meet specific industrial nutrition problems which may affect production increasing absences and accidents. Dr. Robert S. Goodhart, New York, recently appointed a member of the U. S. Public Health Service, will direct the nutrition advisory service to industry. Assisting Dr. Sebrell and Dr. Goodhart will be Dr. Mark Graubard, biochemist, formerly on the staff of Columbia University, and Ernestine Perry, formerly of Springfield, Mass. The entire project is directed toward reducing the twenty-four million man hours lost monthly on the production fronts, and the entire program will move forward on three fronts: industry, homes and communities.

MEDICAL SUPPLIES ARRIVE SAFELY IN CHINA

Dr. Robert B. McClure, who left New York City last November, has arrived safe in Kweiyang, China, with a consignment of cases containing medical supplies furnished by the Medical and Surgical Relief Committee of America, 420 Lexington Avenue, New York. Another physician, Dr. Dietrich V. Wiebe, of Reedley, Calif., has left more recently with additional medical and dental supplies for service in China, with an ambulance unit sent there by the American Friends Service.

ARMY PERSONALS

Dr. Pashnpati J. Sarma, formerly associate professor of surgery at the University of Illinois College of Medicine, Chicago, is reported to have been promoted to the rank of colonel in the Army while serving at Camp Barkley, Texas.

Col. Raymond F. Metcalfe, M. C., U. S. Army, retired, until recently on duty at the San Francisco Port of Embarkation, has been ordered to duty in Washington, D. C., and will be succeeded at the Port of Embarkation by Col. Wallace DeWitt, U. S. Army, retired.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Institutes on Wartime Industrial Health.—The California State Department of Public Health is conducting a series of institutes on wartime industrial health in cooperation with the California Medical Association and the Western Association of Industrial Physicians and Surgeons. The institutes opened on August 18 in San Francisco and were held in Crockett August 19 and Oakland August 21. They will be held in San Diego on August 25, Inglewood August 26, Glendale August 27 and Huntington Park August 28. Out of state speakers include Dr. Carey P. McCord, Detroit, "The Conservation of Industry's Manpower" and J. J. Bloomfield, Bethesda, Md., "Industrial Hygiene in War Production."

Dr. Wilbur to Continue as Head of Stanford University.—Dr. Ray Lyman Wilbur, president of Stanford University since '916, will continue to head the university through the academic year ending August 1943, because of the war emergency. According to an announcement from the school, this is the third time since he reached the retirement age in 1940 that he has consented to continue to direct the university. Recently, to honor him for his long service to the university, the title of chancellor was conferred on him. During a dinner to commemorate this event, given by the alumni of Stanford University School of Medicine, San Francisco, a life size portrait of Dr. Wilbur was unveiled, the work of Josef Sigall.

DISTRICT OF COLUMBIA

Experimental Rate Plan Adopted at Gallinger Hospital.—The district commissioners have approved a formula for charges to be levied against patients admitted to Gallinger Municipal Hospital; the formulas are to be graded according to the patient's income and dependents. The plan will be carried out for a sixty day experimental period beginning at once, the Washington *Star* reported, July 31. The plan provides that no person shall be eligible to receive medical care at the expense of the district if he has an interest in real property with an assessed valuation of $2,500 or more or if he has real or personal property of $250 or more. Patients will be required to sign promissory notes to cover the cost of hospitalization, it was stated. The adopted formula sets up three categories: one is for Gallinger patients who are indigent to a degree not warranting hospitalization charges, the second is for the partially indigent, prescribing charges ranging from 50 cents to $3.50 a day, and the third is for persons deemed in a position to warrant a full charge, which is $4 a day.

ILLINOIS

Health Advisory Committee Appointed.—On July 21 Governor Green appointed a special state health advisory committee, consisting of thirty-one members, to serve in an advisory capacity to the state division of maternal and child hygiene, according to the Chicago *Sun*. Dr. Frederick H. Falls, Chicago, professor and head of the department of obstetrics and gynecology, University of Illinois College of Medicine, is chairman of the new committee, and Drs. Roland R. Cross, Springfield, state health director, and Fred L. Adair, chief of the state division of maternal and child hygiene, are ex officio members. The committee will give advice on wartime problems in protection of the health of mothers, expectant mothers, infants and children.

Chicago

License Revoked for Association with Abortionist.—The Illinois State Department of Registration and Education on June 6 revoked the license to practice medicine of Dr. Josephine Gabler. The action was taken after an exposé of an abortion racket in the city in which her name had been mentioned. Newspapers reported that the physician was charged with "being associated with and lending the use of her name to Mrs. Ada Martin," who stood trial for conspiracy to commit abortions. Newspapers also reported that Dr. Gabler admitted that she sold her loop medical practice to Mrs. Martin and further that both Mrs. Martin and her daughter were her employees prior to the sale of the practice, but she maintained she knew nothing about Mrs. Martin heading an abortion ring. It was also stated that the investigation of the abortion ring resulted in two suicides, a murder and a "shakeup" in the state's attorney's office. Dr. Gabler graduated at Dearborn Medical College in 1905 and was licensed to practice in Illinois in the same year.

INDIANA

Changes in Health Officers.—Dr. Roy H. Elliott, Connersville, has been appointed health officer of Fayette County to succeed the late Dr. John S. Leffel, Connersville.——Dr. Floyd L. Burris is the new health officer of Michigan City, succeeding Dr. Norman R. Carlson, who is with the U. S. Army Air Corps at Hill Field, Ogden, Utah.——Dr. Frank A. Beardsley, Frankfort, has been appointed health officer of Clinton County to succeed Dr. Bruce A. Work, Frankfort, who is in the Army.

IOWA

Psychologist Named to Direct Child Welfare Station.—Robert R. Sears, Ph.D., formerly research assistant at the Institute of Human Relations, Yale University, New Haven, has been appointed head of the Iowa Child Welfare Research Station, Iowa City. Dr. Sears received his degree in doctor of philosophy at Yale in 1932 and has served on the staffs of the University of Illinois Institute of Juvenile Research, Chicago, and Wesleyan University, Middletown, Conn. Dr. Sears succeeds George D. Stoddard, Ph.D., who became New York State commissioner of education on July 1 and who is a member of the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association. The child welfare research station is part of the State University of Iowa College of Medicine.

KANSAS

Personal.—Drs. Floyd C. Taggart, Paul E. Belknap, Milton B. Miller and William C. Menninger were elected members of the Topeka Board of Health recently.——Dr. Herman P. Daniels, Wichita, observed the completion of fifty years in the practice of medicine recently.

Society News.—Dr. Joseph W. Kelso, Oklahoma City, among others, addressed the Southeast Kansas Medical Society in Neodesha, June 25, on "Cancer of the Cervix."——The Golden-Belt Medical Society was addressed in Manhattan, July 9, among others, by Dr. Frank A. Krusen, Rochester, Minn., on physical therapy.

State Society Appoints New Committees.—The Kansas Medical Society has announced the creation of three new committees: the committee on the control of appendicitis with Dr. Harry Lutz, Augusta, chairman, the committee on conservation of hearing with Dr. Lyle S. Powell, Lawrence, chairman and the committee on plasma, of which Dr. Warren F. Bernstorf, Winfield, is chairman.

LOUISIANA

Tulane Professors Visit Venezuela.—Three members of the faculty of Tulane University of Louisiana School of Medicine, New Orleans, left on July 4 for a tour of hospitals and medical schools in Venezuela. The three physicians are Drs. Hiram W. Kostmayer, acting dean of the medical school; E. W. Alton Ochsner, William Henderson professor of surgery, and William A. Sodeman, assistant professor of medicine. They will make a study under the direction of Dr. Alfred Gage, associate director of the medical department of the Standard Oil Company. One object of the trip will be to complete plans for the oil company to send two Venezuelan students to Tulane each year for medical and premedical work, according to the New Orleans *Times Picayune*.

MINNESOTA

Kenny Unit to Be Set Up in Public Health Center.—Plans are under way to establish clinics and hospitalization for the treatment of anterior poliomyelitis and its resultant paralysis at the Public Health Center, Minneapolis, formerly known as the Lymanhurst Health Center. The clinics would be under the direction of Sister Elizabeth Kenny, who has been in Minneapolis for some time directing work of this kind. If the program goes through, the hospital element of the center will be transferred to the Minneapolis General Hospital. The Public Health Center houses a 40 bed hospital for the study and treatment of incipient and rheumatic heart disease in children, outpatient clinics for tuberculosis control in adults and children, a cardiac school clinic and a venereal disease control clinic, all of which services are conducted by the division of public health.

NEW HAMPSHIRE

Dr. Frechette Appointed Secretary of Health Board.—Dr. Alfred L. Frechette, formerly director of the division of venereal disease control of the New Hampshire State Board of Health, Concord, has been appointed secretary and executive officer of the board. He succeeds Dr. Travis P. Burroughs, who resigned to accept a commission as surgeon in the U. S. Public Health Service Reserve. Dr. Frechette graduated at the University of Vermont College of Medicine, Burlington, in 1934 and at the Harvard School of Public Health in 1939.

NEW JERSEY

Ill Award Goes to Dr. E. Zeh Hawkes.—The third Edward J. Ill Award was recently presented to Dr. E. Zeh Hawkes, Newark, formerly president of the Medical Society of New Jersey. The award was established by the Academy of Medicine of Northern New Jersey in honor of the late Dr. Edward J. Ill, who was the academy's first president. Dr. Hawkes was born in Schenectady, N. Y., in 1865. He graduated at Columbia University College of Physicians and Surgeons in 1890, later serving on the staffs of the Newark Hospital, St. James Hospital of Newark and Presbyterian Hospital, where he is now medical director. Dr. Hawkes, who received the award for his leadership in the development of medical activities in Newark, once served as president of the Medical Society of Essex County and the Academy of Medicine of Northern New Jersey.

NEW YORK

Personal.—Dr. Charles E. Martin has resigned as medical director of the Albany Hospital to accept a similar position with the Bell Telephone Laboratories in New York City, succeeding Dr. Melville H. Manson, who has been appointed medical director of the New York Telephone Company's metropolitan area.

Postgraduate Lectures.—Two lectures will be given at the New York Hospital, White Plains, September 9 and November 11, under the auspices of the subcommittee on maternal welfare of the Medical Society of the State of New York for the Westchester County Medical Society. The speakers will be Drs. Mervyn V. Armstrong, Brooklyn, on "Hemorrhage in the Last Trimester of Pregnancy" and Harvey B. Matthews, Brooklyn, "Heart Disease Complicated by Pregnancy."

New York City

Dr. Rice Appointed Deputy to Health Department.—Dr. John L. Rice, who resigned recently as city health commissioner, has been appointed a deputy health commissioner. Dr. Rice retired as city health commissioner on account of ill health.

Changes at Cornell.—Included among the recent changes at Cornell University Medical College are the following: Drs. Nelson W. Cornell, Guilford S. Dudley and Arthur Palmer to associate professors of clinical surgery; Dr. Ade T. Milhorat to associate professor of medicine; Drs. Philip M. Stimson and May G. Wilson, associate professors of clinical pediatrics. Assistant professors are Drs. Edwin T. Hauser and Henry S. Dunning, clinical medicine; John H. Eckel, clinical surgery; George Burroughs Mider, pathology, and Charles O. Warren, anatomy. Dr. John M. McLean has been named associate professor of clinical surgery (ophthalmology).

PENNSYLVANIA

Personal.—Dr. Meyer K. Amdur has resigned as chief of the reconstruction service, Veterans Administration Facility, Coatesville, to become assistant superintendent at the Longview State Hospital, Cincinnati.——Dr. Edgar S. Buyers, Norristown, was recently guest of honor at a dinner given by the Bucks County Medical Society in Doylestown in recognition of his thirteen years' service as councilor for the second district of the state medical society.

Philadelphia

Dr. Macfarlane Appointed Research Professor.—Dr. Catharine Macfarlane, professor of gynecology, has been made research professor of gynecology at Woman's Medical College of Pennsylvania in recognition of her work in cancer research at the college. According to the *News Letter* of the Woman's Medical College, Dr. Margaret C. Sturgis has been appointed professor of gynecology. Both physicians are graduates of the medical school.

Memorial Fund to Dr. Martha Tracy.—The establishment of a fund to be known as the Martha Tracy Preventive Medicine Memorial Fund was announced in the *Medical Woman's Journal* for July. To be used for the care of women medical students, the fund will honor the late Dr. Tracy, who at the time of her death was assistant director of public health. Formerly she had served for many years as dean of the Woman's Medical College of Pennsylvania. The *Medical Woman's Journal* is the official publication of the American Medical Women's Association, of whose scholarship awards committee Dr. Tracy served as chairman.

SOUTH CAROLINA

Assistant Secretary Appointed.—Dr. Julius Howard Stokes, Florence, has been appointed assistant secretary of the South Carolina Medical Association.

University Physicians Appointed.—Drs. Foster M. Routh, Columbia, and Kathleen A. Riley, Florence, have been elected to serve as physicians for the University of South Carolina, Columbia, during the absence of Dr. Edward H. Law, Columbia, who is on leave of absence with the Army. Dr. Routh will serve as physician to men and Dr. Riley as physician to women. In addition they will teach classes in the department of hygiene.

Changes in Health Officers.—Dr. James C. Brabham, Laurens, has been appointed in charge of the district health unit covering Laurens, Spartanburg, Cherokee, Union, Chester, Lancaster, Chesterfield, York, Kershaw, Fairfield and Newberry counties.——Dr. George E. Parkhurst, Charleston, assistant surgeon, U. S. Public Health Service, has been assigned as director of the venereal disease program of the Charleston County health department.——G. G. Caughman, Ph.G., has been chosen health officer of Columbia.

TEXAS

Physician's Will Establishes Memorial Fund at Baylor.—The Clarence M. Grigsby Memorial Fund will be established at Baylor University College of Medicine, Dallas, under a bequest mentioned in the will of the late Dr. Grigsby. The fund will be derived from the sale of his home and furniture, the proceeds to go to the Southwestern Medical Foundation to establish a fund which will be used for the purchase of medical literature at the medical school.

Memorial Shaft Honors Country Physician.—On June 10 hundreds of former patients and friends of the late Dr. William J. Sparks, Poolville, gathered to dedicate a granite memorial shaft to him. The shaft is placed in the square of the town of Poolville under the sponsorship of the school trustees and was given by Orville Bullington, an attorney of Wichita Falls, as an expression of the appreciation for aid and counsel given him and other youths reared in the Poolville community, newspapers reported. Dr. Roy H. Gough, Fort Worth, representing the state medical association, gave the dedicatory address.

VIRGINIA

Changes in Health Personnel.—Dr. Edward M. Holmes Jr., for several years director of the division of venereal disease control of the state department of health, has been assigned as venereal disease control officer at Randolph Field, Texas. Dr. Wallace E. Baker, Petersburg, assistant to Dr. Holmes, has been named acting director of the division of venereal disease control for the duration.——Dr. Hubert D. Crow has been appointed director of a combined district health unit comprising the counties of Southhampton, Isle of Wight, Nansemond and the city of Suffolk, with headquarters in Suffolk.

State Commissioner of Mental Hygiene Appointed.—Dr. Hugh C. Henry, Richmond, director of state hospitals, has been appointed commissioner of mental hygiene and hospitals, a newly created position provided in the state government reorganization act, effective July 1. According to the Norfolk *Pilot* the reorganization act establishes a department of mental hygiene and hospitals with the commissioner as principal executive officer, making him subject to reappointment by the governor instead of by the board as is now the case. Dr. Henry graduated at the Medical College of Virginia, Richmond, in 1896. He was assistant physician at the Central State Hospital until 1924, when he became superintendent. The hospital is one of six state mental hospitals which Dr. Henry supervises. He has been director of state hospitals since July 1, 1938, when the post was created.

GENERAL

Meeting Canceled.—The annual meeting of the American Association of Railway Surgeons, which was scheduled to be held in Chicago, September 10-12, has been canceled and all such future meetings postponed for the duration of the war.

Motion Picture on Back Siphonage.—The Plumbing and Heating Industries Bureau has prepared a motion picture illustrating the dangers to health of faulty plumbing, using a story based on a lawsuit. The picture shows clearly that disease may result from the drinking of polluted water caused by back siphonage of plumbing fixtures. The motion picture is available for showing before medical students, medical societies and county health officers. Those desiring to borrow this film may communicate with Mr. Norman J. Radder, Plumbing and Heating Industries Bureau, 35 East Wacker Drive, Chicago.

Blood Procurement Project Expanded.—The American Red Cross has announced that the expansion of its blood procurement project has been requested by the surgeon generals of the Army and Navy from the original 900,000 donors during the current fiscal year to a minimum of 2,500,000. This increase will require approximately 50,000 volunteer donations a week. In addition to dried plasma, blood collected is to be processed into human serum albumin, also used for transfusions. Serum albumin as a blood substitute is a recent development and, as is the case with powdered plasma, blood used in preparing serum albumin must be shipped in refrigerated containers and must be in the laboratory within twenty-four hours after being drawn. Serum albumin when prepared for shipment is in solution. Nothing need be added before the transfusion is given. A unit of the serum consists of 25 Gm. of albumin dissolved in 100 cc. of isotonic solution of sodium chloride. According to present indications, serum albumin will last for years without deterioration. It does not require refrigeration and can be kept at temperatures ranging from slightly above freezing to approximately as high as 120 F.

"Pathologist" Passes Bad Checks.—Physicians are being warned of one Morris L. Weiss, who has been seeking employment as a pathologist and laboratory technician but who has been using his credentials to pass worthless checks and otherwise obtain money from innocent persons. The most recent venture of Weiss comes in a report from Dr. Edward J. McCormick, Toledo, Ohio, who is chief of staff of St. Vincent's Hospital, where Weiss was employed for probably three or four weeks, during which time he borrowed money from several doctors, sold books to interns and a blood pressure apparatus to one young physician, and left a large bill at the Willard Hotel and an unfinished financial transaction at the finance company concerning an automobile. He claims to have majored in bacteriology and to have received a Ph.D. degree from the University of Vienna in 1928. He also claims to do all routine laboratory tests, tissue work and research. The chief of police in the city of Brockton, Mass., on July 8, reporting a bad check passed by Weiss, described him as follows: 51 years of age, 5 feet 6 inches in height, black hair with a tendency toward baldness, and weight about 200 pounds. Other letters indicated that Weiss had been active in Nashua, N. H., and Gloucester, Mass.

Nutrition Values of Canned Foods Study.—A research program for the study of nutrition values of canned foods has been inaugurated with grants by the National Canners Association and the Can Manufacturers Institute with supplementary grants from the University of Wisconsin, Madison. The first phase of the program will cover the assay of about twenty-five products including fruits, vegetables and seafoods for six vitamin factors which are regarded as being of established importance in nutrition, namely A, C, thiamine, riboflavin, niacin and pantothenic acid. Assays for the vitamins will be made at three universities prominently identified with advances of knowledge in nutrition. Mineral analyses will be made in laboratories connected with the canning industry. In addition to the vitamin and mineral analyses, support will be given to other studies to be conducted in two other universities. According to an announcement it is desired to determine the effect of storage on vitamin content of representative products and to make a series of correlation tests which will compare the results from methods used for assays and those from standard feeding tests. Other investigations will pertain to the distribution of vitamins as between solids and liquid content, and the changes that may result from the preparation of foods for the table. The program is directly alined with the principles for research which arose from the President's conference on nutrition in 1941. It was developed by an executive committee consisting of representatives of nationally related firms and was projected with the assistance of authorities in both the canning industry and the nutrition field. An advisory committee representing the canning industry has been named, and it is expected that within the near future a scientific advisory group will be appointed.

American College of Surgeons.—The 1942 Clinical Congress of the American College of Surgeons, originally scheduled for October at the Stevens Hotel, Chicago, which was taken over on August 1 by the United States Army Air Corps, will be held in Cleveland with headquarters at the Cleveland Municipal Auditorium, November 17-20. The twenty-fifth annual hospital standardization conference sponsored by the college will be held simultaneously. The program will include panel discussions, clinical conferences, scientific sessions, hospital meetings, medical motion picture exhibitions at headquarters, and operative clinics and demonstrations in the local hospitals and Western Reserve University School of Medicine. The program of both meetings will begin with a joint general assembly on Tuesday morning, November 17, with addresses by Surg. Gen. James C. Magee, U. S. Army; Surg. Gen. Ross T. McIntire, U. S. Navy; Surg. Gen. Thomas Parran, U. S. Public Health Service; Lieut. Col. George Baehr, chief medical officer of the U. S. Office of Civilian Defense; Dr. Frank H. Lahey, Boston, chairman, directing board, Procurement and Assignment Service; Dr. Irvin Abell, Louisville, Ky., chairman of the board of regents of the college and chairman of the Health and Medical Committee of the Federal Security Agency, and Dr. William Edward Gallie, Toronto, president of the college. The surgeon generals and Colonel Baehr will also speak at the presidential meeting and convocation the same evening. The Forum on Fundamental Surgical Problems, inaugurated at the 1941 Clinical Congress, will be repeated to give the younger men, representing various university departments of surgery, an opportunity to present the important results of their clinical and experimental research work before a large surgical meeting. The forum will be held on three successive mornings.

Society News.—Dr. George W. Kosmak, New York, is president of the American Gynecological Society for the ensuing year and Dr. Howard C. Taylor Jr., New York, secretary.——Carl R. Moore, Ph.D., Chicago, was named president-elect for the Association for the Study of Internal Secretions at the recent annual meeting and Dr. Eberle Kost Shelton, Los Angeles, was inducted into the presidency. Dr. Henry H. Turner, Oklahoma City, was reelected secretary. The next annual session will be in Cleveland, April 5-6, 1943.——Dr. Robert L. Moorhead, Brooklyn, was elected president of the American Broncho-Esophagological Association at its annual meeting in June. Dr. Fletcher D. Woodward, Charlottesville, Va., is vice president and Dr. Paul H. Holinger, Chicago, secretary.——Dr. Zoe A. Johnston, Pittsburgh, was chosen president-elect of the American Medical Women's Association during its recent meeting in Atlantic City and Dr. Helena T. Ratterman, Cincinnati, was installed as president. Dr. Mabel E. Gardner, Middletown, Ohio, is secretary. The association will meet in San Francisco in 1943 two days previous to the opening of the annual session of the American Medical Association.——Dr. Grover C. Penberthy, Detroit, was chosen president-elect of the American Association for the Surgery of Trauma at its annual meeting in Boston, June 6, and Dr. Charles S. Venable, San Antonio, Texas, was installed as president. Other officers include Drs. Ralph G. Carothers, Cincinnati, vice president; Gordon M. Morrison, Boston, secretary, and Arthur R. Metz, Chicago, treasurer.——Dr. Thomas H. Dickson, medical director of the Minnesota Mutual Life Insurance Company, St. Paul, was elected chairman of the medical section of the American Life Convention at its annual meeting in Denver recently. He succeeds the late Dr. Wilton F. Blackford, Louisville, Ky. Dr. Benjamin F. Byrd, medical director of the National Life and Accident Insurance Company, Nashville, Tenn., is the secretary.——Roy C. Newton, Ph.D., vice president in charge of research for Swift & Company, Chicago, was named president of the Institute of Food Technologists at its annual conference in Minneapolis. Edwin J. Cameron, Ph.D., National Canners Association, Washington, D. C., was named vice president and George J. Hucker, Ph.D., New York Agricultural Experiment Station, Geneva, secretary-treasurer.——The American Association for the Advancement of Oral Diagnosis will hold its ninth annual congress at the Forsyth Dental Infirmary in Boston, November 12-13, on the

theme "The Military Aspects of Oral Diagnosis." H. Justin Ross, D.D.S., 515 Madison Avenue, New York, is the secretary.——The annual meeting of the International Association of Milk Sanitarians will be held in St. Louis, October 30-31, with headquarters at the Hotel Jefferson. Frederick W. Fabian, Ph.D., Lansing, Mich., is president and Mr. C. S. Leete, Albany, N. Y., is secretary-treasurer.——The annual meeting of the Southern Psychiatric Association will be held in Richmond, Va., November 6-7, immediately preceding the annual convention of the Southern Medical Association.

Deaths in Other Countries

Premier Dr. Refik Saydam, formerly a medical attendant to the late Mustafa Kemal "Ataturk" and health minister in the first Republican Cabinet, died in Istanbul, Turkey, according to a dispatch of July 8. Dr. Saydam served as interior minister in 1938 and became prime minister in 1939. He had been secretary general of the Republican People's Party since 1938. According to the New York *Times,* Dr. Salahaddin Refik Bey, as he was known until Kemal Ataturk reformed Turkish names, was head of the public health administration in Samsun, when he met Kemal Ataturk. He became the dictator's physician and entered politics.——**Dr. Federico Grande Rossi,** Havana, Cuba, died on July 11, aged 76. He graduated at the University of Havana in 1888.——**Prof. Richard Willstaetter,** 1915 Nobel Prize winner in chemistry for his research in chlorophyl and other vegetable colorants, died in Locarno, Switzerland, aged 70, of heart disease. In 1933 Dr. Willstaetter received the Willard Gibbs Medal of the Chicago section of the American Chemical Society. His research with cocaine alkaloids culminated in the synthesis of cocaine and made possible the commercial synthesis of local anesthetics. He attached the quinines and quinioid substances and discovered orthoquinine and proof of the structure of aniline black. Dr. Willstaetter's experiments with the carotinoids have made possible the separation of the individual components of this group.

CORRECTIONS

Decree of Nullity of Marriage Obtained by Blood Test.—In the London Letter appearing in the July 25 issue (page 1038, last paragraph) the child's group should have been listed as ABMN instead of as ABN.

Pregnandiol Excretion.—In the article by Genitis and Bronstein entitled "Pregnandiol Excretion in Female Pseudohermaphroditism" in THE JOURNAL, June 27, page 705, in the second column, ninth line, the word "menstruation" should have been "mensuration."

Government Services

Annual Report of Public Health Service

The seventieth annual report of the U. S. Public Health Service for the fiscal year 1941 states that the provisional death rate from all causes for the calendar year 1940 was 10.5 per thousand of population, about 1 per cent higher than in 1939, when the lowest death rate in the history of registration occurred. The maternal mortality rate declined for the eleventh consecutive year. Only fifteen of forty-one states reporting had an increase over 1939. For the entire group the rate for 1940 was 3.6 per thousand births. The 1940 infant mortality rate of 47 per thousand live births was the lowest on record, representing a decline of 16 per cent from the rate of 56 per thousand for 1936. There was a slight increase in the birth rate for 1940; available data for the first quarter of 1941 indicate that the upward trend will continue. The 1940 death rate from automobile accidents was 24.3 per hundred thousand of population, the highest since 1937. Data for the first quarter of 1941 indicated an alarming increase in automobile fatalities; the rate increased 22 per cent over that for the first quarter of 1940.

Despite continued warnings, plague in rodents continues to spread eastward. One fatal human case was reported in 1940.

The report discusses the cooperation of the public health service with other agencies and mentions particularly the twenty-two fellowships in public health and medicine granted in 1940-1941 to medical graduates from Latin American countries. Other activities included the appointment of a special committee to study civilian defense in Great Britain and the development of a program for emergency medical service in the Office of Civilian Defense, Washington.

The most important health legislation enacted during the year was designed to assist the service in meeting the special problems created by the national defense program. Congress in March 1941 appropriated more than $500,000 to provide public health service personnel and facilities to state health departments in critical areas. The regular appropriation to the service for the fiscal year 1942 included a sum of $1,235,000 for emergency health and sanitation activities. In a subsequent act an additional $1,940,000 was allocated to expand these services. A further appropriation of $1,250,000 was made to assist schools of nursing in training additional student nurses and in providing refresher courses and postgraduate training.

Emphasis was placed on the federal-state cooperative programs for general public health services, venereal disease control and industrial hygiene. In 1940 officials of the army, the navy and the public health service and state health departments signed a working agreement for the control of venereal diseases in extracantonment areas. The state health departments, with the cooperation of the public health service, agreed to prosecute the control of venereal disease in civilian populations contiguous to military camps, and the army and navy agreed to supply information on contacts of infected military personnel to local health authorities. Prostitution complicates the control of venereal disease in practically all defense areas. The Selective Service System adopted the routine blood testing of all registrants called for physical examination. The tests were made in the state laboratories, and the public health service undertook to tabulate the results of the serologic tests and of physical examinations for syphilis and gonorrhea. Preliminary reports indicate that clinical syphilis rates are much lower among the first million men examined in 1940 than in the first million examined in 1917. The data reveal a wide variation in the prevalence of venereal disease from state to state. Just prior to the close of the fiscal year a venereal disease control program in representative defense areas was planned in cooperation with the Works Projects Administration to evaluate methods of venereal disease control in selected areas, including urban communities of varying population sizes and rural communities. Special emphasis will be placed on the follow-up and treatment of contacts of military and industrial personnel. In 1935 only six states had functioning industrial hygiene services. In 1941 thirty-two states and four large cities had industrial hygiene units, reflecting the impetus given to these programs under title VI of the Social Security Act. In February 1941 the subcommittee on industrial hygiene and medicine of the Health and Medical Committee designated the Division of Industrial Hygiene of the public health service as the agency to coordinate all activities for the health of defense workers and, under the program adopted, special assistance has been effected and concentrated projects have been launched.

Two new buildings at the National Institute of Health, Bethesda, Md., were occupied during the year, completing the physical plant of the institute. A division of chemotherapy in the institute was created by merging the functions and personnel of the division of pharmacology, the nutrition unit of the division of chemistry and the chemotherapy unit of the division of infectious diseases. A unit for coordination of research in the field of gerontology was set up and a national advisory committee created.

Substantial protection against whooping cough by use of a two dose alum precipitated pertussis vaccine developed at the National Institute of Health constitutes one of the most immediately practical accomplishments during the year. A hyperimmune rabbit serum for the treatment of Rocky Mountain spotted fever also was developed. Present indications are that in the serum a useful therapeutic agent is found for the first time. Other research showed that, contrary to popular conception, there is little difference in the severity of Rocky Mountain spotted fever in Eastern states as compared to the Northwestern states, where it has long been thought excessively virulent. New foci of the infection were found in sixty-two counties in eighteen states.

Of fifteen recommended grants-in-aid for cancer research, recommended by the National Advisory Cancer Council, twelve, totaling $77,780, had been paid. Cancer control programs were established in Arizona, New Mexico, Wyoming, Montana and Idaho, bringing the total of state and territorial cancer programs to thirty-nine. Consultation services were provided to these organizations, and radium loans to forty-one hospitals were renewed and loans were made to three other institutions. About 2,000 patients were treated in these hospitals with government owned radium; thirty-one trainees in the diagnosis and treatment of cancer were on the payroll.

SPECIAL NEWS

(THIS NEWS WAS ASSEMBLED ESPECIALLY FOR USE IN THE JOURNAL)

Public Health Under Hitler's Rule.—The German government has passed a new law for the protection of mothers, which applies particularly to working women who replace men who have been called into the armed forces. The law, prepared in the reich Ministry of Labor, according to DNB of May 15, insures the protection of all female workers. It prohibits the employment of pregnant and nursing mothers on a number of jobs which might harm them. Every woman must be completely exempt from every kind of work for six weeks before and six weeks after the birth of a child. This period is increased to eight weeks in the case of nursing mothers. The nursing of children is encouraged by the granting of a paid nursing period. The law prohibits employing pregnant and nursing mothers on overtime, nightwork and holiday work. The law has extended protection against dismissal far beyond its previous scope. Any one now who dismisses a pregnant woman because of her pregnancy commits a punishable offense. Women must not be given notice of dismissal for other reasons from the beginning of pregnancy until four months after childbirth. Mothers will receive during the protection periods a weekly sum corresponding to the full amount of their wages. Employers must continue to pay regular wages to women not insured under the health insurance scheme provided by law. The new law, according to DNB, is an eloquent expression of the gratitude which Germany shows to its working mothers.

According to the *Deutsche Tuberkulose-Blatt* of April, Dr. Elisabeth Dehoff, a specialist for pulmonary diseases in Dresden, writes: "We have abundant work for our people, and every employer is only too glad to find a worker without asking much about the state of his health. About 60 per cent of all persons with open pulmonary tuberculosis and 80-90 per cent of those with stationary tuberculosis are now employed, partly in very unsuitable occupations. The ideal would be to find for all patients, whether with open or stationary tuberculosis, suitable jobs which do not make them ill again and in which they can earn their living without infecting other people. This would be the only sensible way of absorbing the 400,000 persons with open pulmonary tuberculosis into the economic life of Germany. These people constitute a valuable source of labor which we can ill afford to waste."

The *Petit Journal* of April 23 quotes from an article by Dr. Henri Bouquet in *Le Temps:* "Already children are being born whose weight is far below normal. This state of affairs is not likely to improve, and it has been established that undernourishment seriously impairs the reproductive organs of young women. If this danger is not remedied, we are heading straight for disaster. This same thing applies to boys and young men. An adolescent, in order to develop normally, both morally and physically, needs plenty of well balanced food. Does he get it in these days? Figures compiled by experts prove incontrovertibly that he does not. And so to underdeveloped mothers must be added the evil of fathers who are biologically immature.

"Rickets was formerly an exception. Now there are an enormous number of cases, entailing deformation of the spine, which do not react to treatment. The increase both in quantity and in quality of this disease of the bones means a growing generation of people who are deformed or weak, women who not only have difficulty in delivery because their pelvic girdle is the wrong shape but who run a grave risk of having children deformed from their birth. Tuberculosis is also increasing in the number and gravity of its cases. We were warned of this by specialists of children's diseases when the new ration card was introduced. They told us that, because of the meagerness of the rations allowed to children, tuberculosis would find in them an easy prey. This prophecy has been fulfilled and is only too well demonstrated by figures. An enormous number of the children are victims, because their diet, especially from the age of 6 onward, is deficient, and the number of deaths is increasing as the forms taken by the disease become graver. They are no longer exceptions. They are the rule. And what will be the fate tomorrow of those who escape?

"Not only children are threatened but also young people who, having reached the age when their studies are intensified for taking examinations, run the risk of dangerous mental strain. Mental strain is possible for a short time only if it is balanced by increased rations. But now the contrary is the case, and the danger becomes the greater in proportion."

La Province de Namur of April 28 reports that numerous cases of diphtheria have occurred in the neighborhood of Namur.

According to *Reggeli Magyarorszag* of April 16 the chief medical officer stated before a meeting of the Kolozsvar municipal council that the birth rate was constantly rising and that from 18 to 20 per cent of the births were illegitimate.

Krakivski Visti of April 28 reports that the Kiev Medical Institute has reopened and has many hundreds of students, of whom 80 per cent are Ukrainians and about 15 per cent Russians, but no Jews have been registered.

The first German clinic in the Banat which will provide medical advice for German families has been opened. According to *Donauzeitung,* Belgrade, of April 28 there is a medical library, a kitchen, a consulting room and a lecture hall for nurses.

The Helsinki correspondent of the Stockholm *Tidningen* of April 28 writes that he visited the military hospital in the Olonets area, which he found overcrowded with the entire floor covered with beds one against the other. Beds, he said, keep receiving new occupants and, "if the sheets were not changed, they would never have time to cool."

The *Sydsvenska Dagbladet* of April 25 states that according to German reports only 591 cases of typhus (bauchtyphus) occurred in the army up to last autumn, whereas in the first world war 19,000 soldiers died of this disease the first year; only 18 cases of spotted typhus and 6 cases of tetanus were reported, as against 471 and 360 respectively in the last war; there were no cases of cholera as against 1,800 cases in the last war.

Deutsche Rundschau, Bydgoszcz, states that daily in chemists' shops in Bydgoszcz people are asking for things just because some one else in the shop has succeeded in buying them. "Ah! aspirin—let me have a box too," and people buy cough mixtures when they have no cough and ask for plasters which they stop themselves from buying only when they hear they are for rheumatism, which they have never suffered from. "There is a quite extraordinary demand for drops of all kinds, cholera (?colic) drops, stomach drops, valerian, even concentrated (atherische) valerian are asked for again and again. There is no explanation but perhaps it is because these drops contain alcohol. . . . This silly buying craze could have serious consequences, for it might mean that in some houses there were unused medicines lying about while those who really need them could not get any."

Magyarorszag states that Kecskemet is in quarantine because of an unspecified epidemic.

De Telegraaf carries an article by Professor van Sleeswijk, who writes that the number of cases of diphtheria is rapidly increasing. In 1937 there were 1,068 cases, in 1940 1,733 cases, in 1941 5,434 cases, and in the first three and a half months of this year 3,369 cases.

Nationalblatt, Luxembourg, reports that a census among holders of food cards last year gives an insight into the composition of the French population since the outbreak of the war. According to this census there are 39 million people in France today, almost two thirds of whom, 25 million, live in the occupied zone (Alsace-Lorraine with 1.9 million inhabitants is not included in these figures). In the occupied zone, including Paris and the thickly populated industrial districts of the north, there are 90 inhabitants per square kilometer, but in the unoccupied zone with the relatively sparsely populated Alpine districts there are only 56 per square kilometer.

Almost one fifth of the population lives in the nineteen large cities. The number of young people comprised in the population is constantly dropping and the number of elderly persons constantly rising. In unoccupied France there are more old people over 70 than children under 3 years of age. The predominance of these aged elements and the heavy war losses sustained have resulted in a large surplus of women: there are 1,072 women to every thousand men.

The *Neues Wiener Tageblatt* reports that the German-Slovak trade negotiations have been concluded. The objects of the negotiations were the supply of certain goods to the Slovak railways, the establishment of a company to produce clover, lucern and fodder grass seed for domestic and export purposes, and tourist traffic. It has been agreed that sick persons from Germany and the protectorate may visit Slovak watering places even without a medical certificate. Such persons will be selected by the Ministry of Interior or, if they have been insured, by the respective invalid funds. Most of the patients in question suffer from tuberculosis or rheumatism. In order to cover the expenses of medical treatment, a maximum of 400 reichsmarks per person monthly may be transferred. From this sum a maximum of 20 crowns daily may be paid out to the

visitor for personal expenses. The same regulations have been agreed on as to tourist traffic from Slovakia to Germany.

The *Bremer Nachrichten* says that country people are asked, in case of illness, to go first to the district nurse, who will if necessary call in a doctor. Only if this rule is observed will it be possible to assure medical help to people who are really ill and in need of treatment. To take some work off the shoulders of the heavily taxed doctors, midwives are now authorized to issue certificates confirming the existence of pregnancy in women.

Der Deutsche Militararzt, Berlin, relates that a battalion of soldiers had been issued rations of sausage containing pork which was infected with trichinae. The whole battalion, 617 men, subsequently suffered from trichinosis; 1 man died.

The *Akropolis* announces that the people in the Piraeus are being given typhus inoculations, and it is recalled that the Piraeus was quarantined at the end of April because of an outbreak of typhus.

Zora, Sofia, reports that there are 47 new cases of spotted typhus at Skoplje.

Speaking in Hamburg by invitation of Gauleiter Kauffmann, the reich health leader, Dr. Conti said that all the enemy's hopes of weakening the German home front as regards health and productive capacity had been a miserable failure. In fact even today, in the third year of the war, the productive capacity of the reich remains everywhere unaffected. Every possible care must be taken to keep the working people healthy. Admittedly times are not easy, and every individual must deal rigorously with himself. On the question of medical supplies, Conti said "If some headache cure has perhaps of late not always been obtainable from the chemist, this is not of the slightest importance for the health of the people as a whole. On the contrary, one may say that no harm would be done by the restriction of the consumption, among some people, of such medicaments, which has become habitual during the last few years. In the long run this would only benefit the health of the people concerned. On the other hand care has been taken to prevent a shortage of medical supplies which are essential to maintain the health and productive capacity of the German people and to combat epidemics. In wartime the production of medical supplies must be considered from the national health and not the economic point of view. Assistance for the mother with many children and for the expectant mother continues to occupy the first place. Now is the proper time, even in the midst of the fight against Germany's enemies, to lay the foundation stone for the building up of our people on the principles of eugenics. Every woman who now presents the nation with a child makes the highest contribution which, as a German, she can offer to her people."

The German Red Cross has agreed with the reichtsjugendführung to recognize the training given by the Hitler youth and the BdM for "feldscher" and health service girls respectively as equivalent to the basic Red Cross training. Future training will be based on a regulation concerning basic first aid training to be issued by the reich health leader. The Red Cross will put training personnel and facilities at the disposal of the Hitler youth free of charge. The "feldscher" and health service girls are advised on leaving the HJ and BdM to enter a first aid unit of the Red Cross. All health service girls who are members of the "faith and beauty" scheme will be seconded between their seventeenth and twenty-first years for three months' training as auxiliary nurses with the Red Cross. In view of the heavy burden of work at present resting on doctors, the minister of labor has instructed all authorities, when issuing administrative regulations, to consider carefully whether the granting of benefits is to be made dependent on the submission of medical certificates. Where it is already the rule that such certificates must be produced, the authorities must see whether they can be replaced by some other form of evidence.

According to *Aftontidningen,* Stockholm, Norwegian doctors confirm that the difficult food situation in Norway is now beginning seriously to affect the health of the nation. The present rations do not provide the necessary calories, and an unbalanced diet and the insufficiency of vitamins is having a serious effect on the health of the people. The shortage of fat and vitamins is particularly fateful. Scurvy proper has not yet been diagnosed, but many cases of the latest type of scurvy have occurred, caused by shortage of vitamins. The symptoms are tiredness and the inability to work as usual. Jaundice, diphtheria, measles and other sicknesses, which have been very prevalent in Norway recently, are also partly to be attributed to the shortage of vitamin C. Jaundice has been very prevalent lately. In some places up to 25 per cent of the population is suffering from it and the authorities have been compelled to take steps to endeavor to stop it from spreading. Since the introduction of compulsory vaccination there has been much less diphtheria. Measles was very prevalent during the winter, and infantile mortality was much higher than usual. Extraordinary measures have had to be taken to combat the scab, which is widespread. The shortage of pure soap and the deplorable housing conditions are making themselves seriously felt. Impetigo, often accompanied by face sores, is now so common that the sufferers must report to doctors. Ulceration of the stomach is more prevalent than before. Venereal disease is increasing, particularly in the cities. The food situation is worst for men working in the forests and it is becoming increasingly difficult to get men for this work. Lately, lumbermen's food has consisted of potatoes only for breakfast and supper. The bread ration had to be reserved for dinner, as it is impossible to obtain either meat or pork and the lumbermen cannot take fish to the forests.

Fylkesavisen, Skien, contained an item to the effect that "the Telemark county hospital has been requisitioned by the German wehrmacht. At present patients are being discharged on as large a scale as possible. The hospital had to be fully evacuated by July 1. Exertions are being made to find room in other parts of Telemark." This was signed by the county sheriff of Telemark.

The *Frankfurter Zeitung* begins an article on the wartime restrictions of the manufacture of medical preparations by assuring ill persons who may feel worried that they will not be exposed to the ravages of their disease without the protection of the medicines which they need. "But even so certain tensions are inevitable, and it cannot be denied that we shall have to adapt ourselves in certain ways, in some cases accept substitutes, and make the sale of more preparations subject to a doctor's prescription." Aperients are one of the categories which are in short supply. The usual aperients are imported from abroad and are therefore no longer available in the customary quantities. On the other hand, constipation may have increased to a certain extent, perhaps because the changed diet does not always entirely agree with people. Nobody takes aperients for pleasure, and the increased purchasing power of the population does not therefore enter into it. The demand for invigorating and vitamin preparations has become particularly pronounced. Obviously everybody would like to maintain his nerves and his working capacity in order to remain equal to the higher demands made on him. The use of sedatives and anodynes derived from barbituric acid and its homologues has become so common in a manner bordering on addiction that the restriction of the sale of these preparations against a doctor's prescription can only be welcomed as a measure which will benefit the health of the people. The position is similar as regards preparations containing quinine. The disappearance of a number of preparations means that many people will have to go without some remedy or other to which they had got used and which has proved its worth. But as far as the problem of medical preparations as a whole is concerned, this can only mean an improvement. For the market was flooded with such a wealth of similar preparations with similar effects, which differed only in the manner of their publicity, that a severe measure of concentration can do no harm.

Havas reports from Istanbul that it has been learned from Athens that cases of typhus have appeared in certain hospitals and the prison at Piraeus. The government has ordered that all cafés, cinemas and theaters are to be closed immediately. The occupying authorities are collaborating with the local authorities in the fight against the epidemic. Public services are rounding up beggars and compelling them to take baths while their clothes are being disinfected.

The Stockholm *Tidningen* publishes a report received from Berlin on June 20 that in Belgium the number of deaths exceeds the births. During April there were 8,745 births and 10,237 deaths, of which 5,601 were men and 4,636 women. In comparison with April 1941 the birth rate has decreased by 1.2 per cent and the death rate by 5.21 per cent.

Foreign Letters

LONDON

(From Our Regular Correspondent)

July 11, 1942.

The National Health After Nearly Three Years of War

Good reports on the national health during the war have previously been given (THE JOURNAL, Dec. 13, 1941, p. 2089, May 30, 1942, p. 431). The survey can now be extended to the third winter of the war and most of the third year, with similar results. In the House of Commons the minister of health, Mr. Ernest Brown, stated that after one thousand days of war the health of the nation was in many respects better than in days of peace. The birth rate of 1941 was 14.2 per thousand as compared with 15.1 in 1938 and 20.9 in 1916. (This only exemplifies the falling birth rate, which was causing concern before the war.) But for the first quarter of 1942 the rate was 15.5, the highest in any March quarter since 1931. The rise can be accounted for by the increase of marriages promoted by the allowances paid for wives and children of the young men joining the fighting services. The infant mortality rate for 1941 was 59, as compared with 53 in 1938 and 91 in 1916. The rate for the first quarter of 1942 was 61, the lowest rate for any first quarter on record. The maternal mortality rate in 1941 was 2.77 per thousand births as compared with 2.97 in 1936 and 4.12 in 1916. Thus while over a long period the birth rate had been falling, over the same period the survival rate had increased. The "crude general death rate" was 12.9 in 1941 as compared with 11.6 (the lowest on record) in 1938 and 14.4 in 1936. The risk of epidemic disease calls for special care in wartime, but during the past two and one half years of war the infectious disease rate has been normal and, on the whole, below the average.

Apart from tuberculosis, the only infectious disease which has shown a rise during the war is cerebrospinal fever. This was expected, since cerebrospinal fever has always been a wartime disease. In 1916 there were about 2,000 cases and in 1938 and 1939, 1,500 and 1,300 respectively. But in 1940 there were nearly 13,000 and in 1941 over 11,000 and, for the first half of 1942, 4,000. The fatality of the disease has been reduced from a percentage of 69 in 1935 to 34 and more recently to 20.

The problem of tuberculosis is causing some concern. There were 28,669 deaths due to it in 1941, compared with 28,144 in 1940, 26,176 in 1938 and 53,858 in 1916. The steady fall in tuberculosis which has been a feature of the twenty-five years of peace has been interrupted in the last two years. Wartime conditions, such as the blackout, overcrowding and the cessation of house building, predispose to tuberculosis. In the past we tended to concentrate on treatment rather than on early diagnosis. The recent developments in miniature radiography are providing a new weapon to detect cases for more detailed examination. From earlier diagnosis better results in treatment are expected. Also rehabilitation and securing gradual return to suitable employment is to be tackled on more comprehensive lines.

The incidence of diphtheria, the chief killing disease of children between 4 and 10, has not fluctuated very widely in the last twenty-five years, but the number of deaths has fallen from 5,300 in 1916 to 2,600 in 1941. During the past year the Ministry of Health has been engaged in a campaign for immunization of children against diphtheria, and this has given striking results in reducing both incidence and fatality of the disease. Scarlet fever has become a scourge of the past, and there were only 133 deaths from it in 1941. In that year there were only 148 deaths from typhoid and fewer than 5,000 as compared with 6,000 cases and 1,100 deaths in 1916. During the heavy bombing of our cities not a single death from typhoid was due to pollution by water borne infection, in spite of the continuous bombing of our crowded areas. American visitors marveled at this. The number of deaths from pneumonia was much greater in 1941 than from all the other infectious diseases combined other than tuberculosis. There were 50,000 cases and 26,000 deaths, compared with 29,000 deaths in 1940 and 23,000 in 1939.

An increase in venereal diseases was not unexpected in view of war conditions but was not so great as in the last war. At the outset steps were taken to expand the existing services. We have always relied on propaganda and education for controlling these diseases. But the work of limiting the spread of infection was hampered by lack of powers to deal with persons unwilling to submit to treatment and known to infect others. This difficult problem is engaging attention.

THE SUPPLY OF NURSES

At the end of April 1939 the number of state registered nurses was 94,200. In April 1942 the number had risen to 103,700. But there is still a shortage, and 12,000 more are required. The tuberculosis service in particular has exceptional difficulties in securing adequate numbers. Fear of contracting the disease in sanatoriums appears to be a factor, though the authorities hold that there is no greater risk than in other hospitals.

SHORTAGE OF DOCTORS

The demand for doctors in the fighting forces has entailed a shortage for civilian purposes. The government has asked the public to recognize the difficulty and do what it can to limit calls to what is essential.

Hospitality to Americans

The eagerness of individuals and private societies to show good will toward Americans, both soldiers and civilians, now in this country has produced numerous offers of hospitality. The government has made arrangements to complete and coordinate such offers. At the request of the secretary of state for foreign affairs, Sir Edward Grigg, M. P. (lately undersecretary for war), became chairman of a small committee to advise on the measures required. The committee has been instrumental in providing facilities, including residential clubs, for the exclusive use of American civilians and officers. At the request of the American Red Cross, the committee has been supplementing its work, which includes the responsibility, conferred on it by the United States government, for the welfare of the American Expeditionary Force. The committee also concentrates on the needs of the many American civilians assisting our war effort.

Operation on the Heart on the Battlefield

During a battle in Libya a bomb splinter nearly an inch wide lodged in the wall of an antiaircraft gunner's heart. He was taken to a field hospital under field conditions with the battle raging outside, and an operation was performed on his heart. For two and one half hours the surgeons worked. A few days later the gunner was well enough to be sent to a base hospital. The doctors in charge of the field unit paid tribute to the orderlies, whose expert nursing helped the recovery.

Marriages

WILLIAM SMITH BROCKINGTON, Charleston, S. C., to Miss Florence Virginia Blake of Kingstree, May 28.

PHILIP HENRY LIVINGSTON, Chattanooga, Tenn., to Miss Jean Doris Wicksman of Nashville, May 24.

JOSEPH LEE MANN to Miss Nan West Phillips, both of Hampton, Va., at Sebring, Fla., June 19.

HERBERT CARL LEE, Milwaukee, to Miss Dovie Johnson Kinlaw of Lumberton, N. C., recently.

FREDERICK FIRESTONE, Jamaica, N. Y., to Miss Sophie Barbara Witzling of New York, May 24.

Deaths

Wade Hampton Brown, Princeton, N. J.; Johns Hopkins University School of Medicine, Baltimore, 1907; instructor of pathology at the University of Virginia, 1907-1908; instructor of pathology from 1908 to 1910 and assistant professor 1910-1911 at the University of Wisconsin, Madison; professor of pathology at the University of North Carolina, Chapel Hill, from 1911 to 1913; joined the Rockefeller Institute for Medical Research in 1913, serving there as an associate member from 1914 to 1922, when he became a member of the scientific staff for medical research; member of the Association of American Physicians, the American Association of Pathologists and Bacteriologists, the American Society for Experimental Pathology and the American Society for Pharmacology and Experimental Therapeutics; aged 65; died, August 4, at Rice Lake, Wis.

Hector Wright Benoit, Brooklyn; McGill University Faculty of Medicine, Montreal, Que., Canada, 1909; member of the Medical Society of the State of New York; fellow of the American College of Surgeons; past president of the Brooklyn Surgical Society; formerly assistant clinical professor of surgery at the Long Island College of Medicine; specialist certified by the American Board of Surgery; on the staffs of St. Luke's Hospital (Newburgh), Bushwick Hospital, Prospect Heights Hospital, Midwood Hospital, Peck Memorial Hospital and the Methodist Hospital; attending surgeon and past president of the medical board of the Kings County Hospital; aged 58; died, June 27, of myocarditis.

Louis Henry Dyke ✠ Oakland, Calif.; Oakland College of Medicine and Surgery, 1916; fellow of the American College of Surgeons; on the staffs of the Alameda County, Peralta and Providence hospitals, Oakland, and the Alta Bates and Berkeley hospitals, Berkeley; aged 64; died, June 2.

Hannibal Blair, Ocosta, Wash.; Willamette University Medical Department, Salem, Ore., 1883; at one time member of the state legislature; formerly mayor and member of the school board of Elma; aged 86; died, June 10, in the Elma (Wash.) General Hospital of coronary disease.

Clement Carl Fihe ✠ Cincinnati; Medical College of Ohio, Cincinnati, 1900; fellow of the American College of Physicians; aged 66; on the staffs of the Good Samaritan Hospital, Cincinnati General Hospital and the Christ Hospital, where he died, June 15, of coronary thrombosis.

Stanley Cullen Cox ✠ Holyoke, Mass.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1910; member of the New England Surgical Society; fellow of the American College of Surgeons; served during World War I; aged 58; died, June 7.

Francis Joseph Butler ✠ Worcester, Mass.; Georgetown University School of Medicine, Washington, D. C., 1908; aged 58; on the staffs of the Hahnemann Hospital and St. Vincent's Hospital, where he died, June 7, of uremia, hypertension and chronic nephritis.

Robert Starke Carey, Washington, D. C.; University of Maryland School of Medicine, Baltimore, 1908; medical officer with the Veterans' Administration and with the Board of Veterans' Appeals; aged 65; died, June 1, in the Georgetown Hospital.

Elijah Tennyson Dando, Wellston, Ohio; Kentucky School of Medicine, Louisville, 1898; Jefferson Medical College of Philadelphia, 1900; for many years postmaster; aged 65; died, June 27, in the Holzer Hospital, Gallipolis, of cerebral hemorrhage.

James Dennis Barrett, South Pasadena, Calif.; Northwestern University Medical School, Chicago, 1906; member of the California Medical Association; aged 61; died, June 10, in the Columbus Hospital, Seattle, of lobar pneumonia.

Hugh John Roy Lindsay, Woodstock, Ont., Canada; University of Toronto Faculty of Medicine, Toronto, Ont., 1906; aged 56; died, May 16, in the Woodstock General Hospital of hemolytic staphylococcus septicemia.

Nelson Henry Clark ✠ Pittsburgh; Harvard Medical School, Boston, 1904; on the staff of the Western Pennsylvania Hospital; aged 68; died, June 16, of cholecystitis and postoperative pneumonia.

John Lane Evans ✠ Brookfield, Mo.; University of Pennsylvania School of Medicine, Philadelphia, 1920; past president of the school board of Brookfield; aged 46; died, June 24, of myocarditis.

Giles S. Hall ✠ Los Angeles; Rush Medical College, Chicago, 1897; aged 73; died, June 4, in the Southern Pacific General Hospital, San Francisco, of uremia and nephrosclerosis.

William T. Gilman, Chicago; Hahnemann Medical College and Hospital, Chicago, 1896; member of the Illinois State Medical Society; aged 81; died, June 10, of chronic myocarditis.

Joseph Chandler, Pardeeville, Wis.; Chicago Medical College, 1889; member of the State Medical Society of Wisconsin; aged 76; died, June 16, in Milwaukee of chronic myocarditis.

Albert E. Copp, Flint, Mich.; Detroit College of Medicine, 1896; formerly mayor of Vassar; at one time coroner of Tuscola County; aged 78; died, June 17, of organic heart disease.

Jennie Anna Duncan, Ottawa, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1910; aged 81; died, June 28, of cerebral hemorrhage.

James Carroll Nash, Harlan, Ky.; Lincoln Memorial University Medical Department, Knoxville, Tenn., 1911; aged 60; died, June 12, of hypertensive cardiovascular disease.

Angus L. Cowan, Detroit; Detroit College of Medicine, 1891; member of the Michigan State Medical Society; aged 76; died, June 21, of myocarditis and coronary sclerosis.

Jane Steele Divine, Atlantic City, N. J.; Woman's Medical College of Pennsylvania, Philadelphia, 1887; aged 82; died, June 16, of acute infection of the urinary tract.

Hans August Reinhard, Milwaukee; Rush Medical College, Chicago, 1903; aged 63; on the staff of St. Mary's Hospital, where he died, June 8, of cerebral hemorrhage.

William G. Brayton, Carey, Ohio; Medical College of Ohio, Cincinnati, 1873; aged 93; died, June 7, in the Sawyer Sanatorium, Marion, of hypostatic pneumonia.

Henry P. Clarke, Indianapolis; Medical College of Indiana, Indianapolis, 1892; aged 75; died, June 25, in St. Vincent's Hospital, of coronary occlusion.

Charles F. Grunewald, Los Angeles; Hahnemann Medical College and Hospital, Chicago, 1892; aged 81; died in June, of auricular fibrillation.

Robert R. Cornell, Birmingham, Ala.; Chattanooga (Tenn.) Medical College, 1902; aged 73; died, June 4, of chronic nephritis and uremia.

Olin Burr Hall ✠ Dayton, Ohio; University of Cincinnati College of Medicine, 1922; aged 49; died, June 8, of Addison's disease.

Samuel W. Chavis, Chicago; Leonard Medical School, Raleigh, N. C., 1911; aged 57; died, June 2, of poison, self administered.

Albert Pain, Hamilton, Ont., Canada; University of Toronto Faculty of Medicine, 1906; aged 58; died, June 28.

Estill Nelson Burke, Catlettsburg, Ky.; University of Louisville School of Medicine, 1926; aged 43; died, June 2.

Frederick D. Brown, Richmond, Va.; Leonard Medical School, Raleigh, N. C., 1912; aged 54; died, June 14.

DIED IN MILITARY SERVICE

John Maurice Hayes ✠ Decatur, Ill.; St. Louis University School of Medicine, 1914; called to active duty as a lieutenant colonel in the medical reserve corps of the U. S. Army Oct. 10, 1941; was awarded the British Military Cross for bravery while in service with the British Army during World War I and was a member of the Order of the Purple Heart; aged 57; stationed at Camp Forrest, Tenn., where he died, June 29, of coronary thrombosis.

Olon H. Coleman ✠ Chattanooga, Tenn.; University of Tennessee College of Medicine, Memphis, 1932; major in the medical reserve corps of the U. S. Army; called to active duty Jan. 15, 1941; served as registrar at Station Hospital, Camp Blanding, Fla., until May 1, 1942; formerly connected with the Tennessee Department of Public Health; aged 34; died, July 20, in the African middle eastern theater of war.

Joseph Franklin Showers, Milton, Pa.; Hahnemann Medical College of Pennsylvania, Philadelphia, 1940; appointed a first lieutenant in the medical reserve corps of the U. S. Army, Nov. 1, 1941; attached to the Second Armored Signal Battalion at Camp Polk, La., where he died, July 26, aged 28, of acute epidemic hepatitis.

Bureau of Investigation

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

The following items are abstracts of stipulations in which promoters of "patent medicines," cosmetics or medical devices have cooperated with the Federal Trade Commission to the extent of agreeing to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Chippewa Natural Spring Water.—This was represented in the advertising to rid the system of poisons, toxins or waste, to be the only natural spring water which can be given to infants without boiling or with safety, and to possess therapeutic properties in the treatment of kidney disorders, rheumatism or arthritis. In June 1942 the Chippewa Springs Corporation and the Hutchinson Advertising Company, both of Minneapolis, and Vince B. Nyhan, trading as Chippewa Spring Water Company, Chicago, stipulated with the Federal Trade Commission that they would remove the foregoing misrepresentations from their advertising. Further, all these stipulators agreed to cease representing that the minerals contained in competitive commercial waters are of no benefit to the user. The Chippewa Springs Corporation separately stipulated that it would cease representing that Chippewa Natural Spring Water, when eliminated, carries with it more waste matter than do competitive commercial waters.

Dr. George R. Davis Shoes.—In August 1941, Knapp Brothers, Inc., Brockton, Mass., stipulated with the Federal Trade Commission that it would discontinue the following misrepresentations in the sale of these shoes: that it has been shown that 90,000,000 or any other definite number or percentage of persons in the United States have some form of foot trouble; that physicians agree that 50 or any other number of diseases are the direct result of ailing feet or that any disease directly results from this condition; that this concern's shoes stimulate normal circulation or possess an antiseptic toe lining; that they give proper support to the arches (unless it is explained that in unusual cases they are not equipped to do so); that they assure perfect ankle alignment, correct, eliminate, prevent or banish flat feet or kindred disorders or defective posture; that they afford instant relief and will banish, correct, eliminate or prevent corns (this claim applies only to proper fitting) or that the wearing of "Dr. George R. Davis Anti-Friction Shoes" assures normal feet.

Minit-Rub.—In July 1941 the Bristol-Myers Company, New York, signed a stipulation with the Federal Trade Commission, agreeing to cease representing that this product is a "special analgesic," that it has any effect on colds beyond relieving chest colds, or that it penetrates to any muscles other than superficial ones, or affords certain other benefits. This stipulation was an amendent to one that the same concern signed with the Commission in September 1937.

Minton's Asthma Remedy.—This is put out by E. L. Bachman and V. E. Chambers, trading as the Sarco Remedy Company, Sidney, Ohio. In June 1942 these persons stipulated with the Federal Trade Commission that they would discontinue the following misrepresentations in their advertising: that their product will prevent, remedy or correct asthma or any underlying cause of this condition or offer any value in its treatment beyond furnishing limited, temporary relief from paroxysms due to or associated with asthma; that the preparation is a preventive, remedy or cure for hay fever or a treatment for bronchial trouble in excess of its action as an expectorant in minor bronchial irritations, or that it has substantial therapeutic value in treating such disorders or will restore health. Further, the respondents agreed that they would disseminate no further advertisements which failed to reveal that their product should not be taken by persons suffering with active or arrested tuberculosis or toxic goiter without first consulting a qualified physician and that, should nausea or skin eruptions follow its use the dose should be reduced. It was permitted, however, to limit the warning to the statement, "Caution: Use only as directed," if the same warning appeared in the directions on the label. The respondents further stipulated that in their trade or brand names they would desist from using the word "remedy" or any abbreviation thereof or any other word, term or abbreviation whose phonetics, spelling or appearance might suggest that the preparation is a preventive, corrective or remedy for asthma, hay fever or bronchial troubles.

Natural Ray Mineral Water.—This was sold under the misrepresentations that it is a remedy or cure for stomach, bladder and kidney disorders, chronic constipation, paralysis, high blood pressure, anemia, glandular difficulties and various forms of rheumatism, among other things; that it is a safeguard, a body builder, a way to gain, retain or maintain health, a preventive of infantile paralysis or other illness or an aid to muscle or bone development, that it affects the appetite, the weight or the ability to sleep, builds up resistance to colds or headaches or wards off colds. Such misrepresentations were to be discontinued according to a stipulation signed with the Federal Trade Commission in August 1941 by the Michigan Magnetic Mineral Water Company and the Natural Ray Mineral Water Company, the latter trading as such and as the Michigan Mineral Water Company, of St. Louis. In September 1941 Charles F. Dowd, Inc., Toledo, Ohio, which handles the advertising of the product in question also stipulated with the Federal Trade Commission that the foregoing misrepresentations would be discontinued.

Nature Nervine.—In July 1942 one Valentine Greenwald, trading as Professor V. Greenwald, Covington, Ky., signed a stipulation with the Federal Trade Commission which provided: that he would cease using the term "Nature Nervine" or any other name representing or implying that the product so designated is a remedy of nature or beneficially affects nerves or nerve disorders; that it has any value in treating epilepsy, exhaustion, insomnia, stomach disorders and other ailments; that it forms blood, strengthens the nerves, builds the brain or promotes health and that it has any physiological action except as a stomachic and mild carminative.

Nutrase and Kleen.—Edward Howell, trading as Medford Laboratory, Chicago, stipulated with the Federal Trade Commission in August 1941 that he would no longer represent that either of these products is a cure or remedy for food discomfort, indigestion, gas, heartburn, gastro-intestinal symptoms, cancer, diabetes, liver trouble or other ailments; that Nutrase is free from drugs or will impart new life or energy, or that Kleen affords perfect intestinal elimination.

Old Mohawk.—In June 1942 Edgar S. Gebhart, trading as Miami Advertising Agency, J. W. Daugherty, trading as Mohawk Medicine Company, and The Quaker Herb Company signed a stipulation with the Federal Trade Commission in which they agreed to cease representing that "Old Mohawk" is safe to use and is a cure for dizzy spells, biliousness, bloating, unsound sleep and other ailments or has therapeutic value except as a temporary laxative for the relief of constipation. Further, they agreed to discontinue designating symptoms of diseases or conditions not generally caused by or directly associated with constipation, in any manner representing that these symptoms are typical manifestations of constipation or that their presence indicates that the sufferer has constipation. Also to be discontinued were advertisements which failed to reveal the potential danger in using Old Mohawk when nausea, vomiting, abdominal pain or other symptoms of appendicitis are present, provided, however, that if the labeling contains adequate warning of such danger, the advertising need bear only the statement: "Caution, use only as directed."

Perspir-ator.—This Turkish bath cabinet was represented in the advertising as a cure or remedy for excess fat, which would keep the pores open, cure colds and help to replace sallow, sluggish skin with a healthy, youthful glow and to remove blackheads and the cause of skin blemishes. In a stipulation signed with the Federal Trade Commission in June 1942 Louis Gordon, trading as Gordon Brothers, Brooklyn, agreed to discontinue these misrepresentations and any advertisements which failed to reveal that a normal person might faint and suffer burns when using the device unattended. It was permitted, however, to limit this warning to the statement, "Caution, use only as directed," if the accompanying directions contained the adequate, necessary warning.

Rex-Lex.—The Rex Remedy Company, Shelby, N. C., signed a stipulation with the Federal Trade Commission in June 1942, to discontinue the following representations for their product: that it is superior to and outsells all competing brands of headache remedies, produces a rested feeling and always relieves nervousness, dizziness or all kinds of pain. The concern further agreed to discontinue any advertisements which failed clearly to reveal that "Rex-Lex" should not be used in excess of the recommended dose lest it cause dependence on a drug, and should not be taken by children. It was provided, however, that this detail could be substituted in the advertising by the simple statement: "Caution, use only as directed" when the labeling carried a warning to the same effect. The Commission reported that Rex-Lex contained acetanilid and potassium bromide.

Triner's Bitter Wine and Triner's Wine Tonic.—In a stipulation signed with the Federal Trade Commission in June 1942 the Joseph Triner Corporation, Chicago, agreed to cease representing that the "wine" will cleanse the stomach, prevent colds and relieve insomnia, headaches, irritability or nerve disease and that the "tonic" will clear the system of accumulated poisons, restore appetite and digestion, assure sleep and maintain good health. The concern further agreed to cease representing by use of the word "tonic" in the title of the first-named product that it is a general tonic; and to discontinue advertisements of these products which failed to reveal that there is potential danger in their use when abdominal pain, nausea, vomiting or other symptoms of appendicitis are present, unless such caution appears on the labeling, in which case the advertisement needs only to warn, "Caution: Use only as directed."

Yoghurt Ferment Capsules.—This preparation is designated to be combined with milk to form "Bulgarian milk" and is put out by Yoghurt Products, Inc., Seattle. A stipulation which that concern signed with the Federal Trade Commission in July 1942 contained the following provisions: that the advertising would no longer represent that the product in question is of itself Bulgarian milk or that the fluid which results from its mixing with milk is healing, purifying or life renewing or that it purifies the blood or energizes organic activities; that it builds the body or enables the user to get well, keep well or stay young; that it destroys disease-breeding bacteria, arrests abnormal fermentation or decomposition or restores or produces digestion or a rational appetite and eliminates toxic poisons.

Correspondence

SUDDEN DEATHS AFTER USE OF MERCURIAL DIURETICS

To the Editor:—In the July 25 issue of The Journal appear a series of careful reports and an enlightening editorial relative to the sudden deaths following the intravenous administration of mercurial diuretics.

Since my work on "speed shock" and the slow intravenous drip, in 1931, I have been intensely interested in the problem of reactions and I ask your leave to comment on the present situation.

I do not think it is sufficiently stressed that these fatalities resulted from a technical cause rather than from the drug itself. This conclusion is borne out by several considerations: 1. Death occurred mostly, if not exclusively, from intravenous injection. 2. Death or the fatal reaction occurred usually within a few minutes after the injection, so that the accident could not have been due to a specific pharmacodynamic action of the molecule itself. 3. So many of the patients had had previous injections that idiosyncrasy to the drug could be eliminated as a provocative factor.

The animal experimentation, despite its splendid execution, is truly not pertinent to the clinical problem. There is a vast difference between intravenous reactions in the decompensated cardiac invalid and those in a healthy laboratory animal! The authors of the articles and the editorial commentator both stressed the moribund condition of many of the patients, and this must be taken into account in discussing the present situation.

I am reasonably certain that the fatal reactions observed are identical with those described as "speed shock." It is true that the clinicians attest slow injections and in certain instances used diluted solution in a gravity drip. The experimenters controlled the speed of injection clearly in their protocols on healthy cats.

However, the syndrome of "speed shock" exists under certain conditions for what would appear to be relatively slow injection. What is a slow injection in a given situation may be an overwhelming administration of a mercury molecule in a decompensated cardiac invalid.

Conscious of this, in our original work Hirshfeld, Wanger and I noted that "We do not believe that any single rate [of injection] can cover all drugs. For obviously hypertonic solution should be given slower than isotonic and larger molecules slower than small molecules. . . . Toxic substances such as copper sulfate must be given intermittently as well as slowly if they are to be given at all" (*Arch. Int. Med.* **47**:286 [Feb.] 1931).

My view of the identity of the reaction causing these mercurial deaths and the syndrome of "speed shock" is susceptible, I believe, of proof. If I am correct, the freshly drawn blood after death should be rendered incoagulable and I urge clinicians to make this simple observation should any one experience again this unfortunate accident.

More important, however, are the broader conclusions relative to the present circumstances and their interpretation. These may be summarized briefly:

1. The reactions immediately following the intravenous injections of a mercurial in a decompensated cardiac invalid are technical and not pharmacodynamic.

2. The reaction resembles, if it is not identical with, the syndrome of "speed shock," in which the blood is rendered noncoagulable.

3. Under the prevailing conditions the reaction may not be averted by a slow intravenous injection of a diluted dose, as in the instance of copper sulfate experimentally.

4. The reaction is averted by intramuscular injection. The great boon of mercurial diuresis must not be withheld through these unfortunate technical reactions which are independent of the pharmacodynamics of the drug.

Harold Thomas Hyman, M.D., New York.

"CONSERVATION OF MEDICAL SUPPLIES"

To the Editor:—I have just read with a great deal of interest the article in the August 1 issue entitled "Conservation of Medical Supplies." I want to tell you how timely I think this article is and to express the hope that you will publish more of them.

I am here on leave of absence from my job as administrator of the Albany Hospital to act as head hospital consultant to the War Production Board.

I am quite sure that most of our hospitals are not yet aware of the seriousness of the war situation and the necessity of doing more than we have ever thought possible to conserve critical materials for our armed forces.

Hospitals and their staff physicians must exercise all the native ingenuity which they possess to learn how to do things without many of the semiluxuries which they have thought to be necessary in the past.

When hospitals do apply to the War Production Board on form PD-1A or PD-200 for things which after careful thought they feel they cannot get along without, please warn them to read the instructions carefully and fill these forms out completely.

It will always be wise to accompany their application with a rather detailed letter of explanation so that the case will be as clear to us as it is to them.

Yours for Victory!

Maury Maverick,
Chief, Bureau of Governmental Requirements.

By E. W. Jones,
Head Hospital Consultant,
Washington, D. C.

RUBBER FROM RUBBER GLOVES NOT A PROTECTIVE AGAINST MUSTARD GAS

To the Editor:—It has come to my attention that many physicians are instructing gas defense workers to the effect that surgical rubber gloves are to be used as protection against mustard gas. This should be corrected, as it may lead to unpleasant consequences.

This particular grade of rubber is not only an inadequate protection but even accentuates mustard gas burns as well as permanently contaminating the rubber itself. Mustard gas is soluble in the rubber, and a droplet that would produce only a small blister on bare skin may spread through an entire glove, in time, and burn the whole surface.

Of course, if no other protection is available, a rubber glove can afford protection for a short time; but the limitations should be recognized.

Mustard gas will not burn the skin rapidly, and even wiping with a cloth is often ample protection; or rubbing the skin with damp earth is an efficient method if no other is available.

I was an officer in the Chemical Warfare Service Experimental Station at American University in 1918, where I had an opportunity to see numerous demonstrations of the sad results of this particular error.

The fact that rubberized fabric is used in gas masks has probably helped to keep alive this fallacy. But the gas mask is of an entirely different grade of rubber, is much thicker and is not in direct contact with the skin.

C. I. Reed, Ph.D., Chicago.

Professor of Physiology, University of Illinois College of Medicine.

SACCHARIN

To the Editor:—In THE JOURNAL of July 25, page 1028, there is a mild comment on the harmlessness of saccharin. Many physicians are not fully aware of its nontoxic nature and are fearful about permitting its indiscriminate use.

In 1916, as a member of the Advisory Council of the New York City Board of Health, I was chairman of a saccharin committee composed of noted chemists such as H. C. Sherman and W. J. Gies. We made an extensive study of the domestic and foreign literature then available, which was considerable, and came to the conclusion that saccharin is nontoxic, either acute or chronic, for human beings, in any amounts that could ordinarily be consumed. We found an extensive use of saccharin in canned goods, chewing gum, soda water flavors, ginger ale, and so on.

For Health Department purposes we concluded that "Saccharin is nonpoisonous. When used in place of sugar, saccharin is an adulterant in that its use substitutes a substance of no food value for one of definite food value."

WALTER A. BASTEDO, M.D., New York.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

CHICAGO, Feb. 15-16, 1943. Sec., Council on Medical Education and Hospitals, Dr. H. G. Weiskotten, 535 North Dearborn Street, Chicago.

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, Aug. 8, page 1218.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 15-16. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery.

ARIZONA: * Phoenix, Oct. 6-7. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS: * *Medical.* Little Rock, Nov. 5-6. Sec., Dr. D. L. Owens, Harrison. *Eclectic.* Little Rock, Nov. 5. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Written.* Sacramento, Oct. 19-22. *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), Los Angeles, Sept. 16. Sec., Dr. Charles B. Pinkham, 1020 N St., Sacramento.

COLORADO: * *Endorsement.* Denver, Oct. 6. *Written.* Denver, Oct. 7-9. Application must be on file not later than Sept. 20. Sec., Dr. John B. Davis, 831 Republic Bldg., Denver.

CONNECTICUT: * *Medical. Written.* Hartford, Nov. 10-11. *Endorsement.* Hartford, Nov. 24. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven. *Homeopathic.* Derby, Nov. 10-11. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DISTRICT OF COLUMBIA: * Washington, Nov. 9-10. Sec., Commission on Licensure, Dr. George C. Ruhland, 6150 East Municipal Bldg., Washington.

FLORIDA: * Jacksonville, Nov. 23-24. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, Oct. 13-14. Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta.

IDAHO: Boise, Jan. 12. Dir., Bureau of Occupational Licenses, Mr. Walter Curtis, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, Oct. 13-15. Superintendent of Registration, Mr. Philip M. Harman, Department of Registration and Education, Springfield.

INDIANA: Indianapolis, Jan. 13-15. Sec., Board of Medical Registration and Examination, Dr. W. C. Moore, 301 State House, Indianapolis.

KANSAS: Kansas City, Sept. 15-16. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

MAINE: Portland, Nov. 3-4. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Medical.* Baltimore, Dec. 8-11. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 8-9. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 17-20. Sec., Board of Registration in Medicine, Dr. H. Q. Gallupe, 413-F State House, Boston.

MICHIGAN: * Lansing, Oct. 14-16. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 203 Hollister Bldg., Lansing.

MINNESOTA: * Minneapolis, Oct. 20-22. Sec., Dr. Julian F. Du Bois, 230 Lowry Medical Arts Bldg., St. Paul.

MISSISSIPPI: Jackson, December. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MISSOURI: Kansas City, Oct. 3. Sec., State Board of Health, Dr. James Stewart, State Capitol Bldg., Jefferson City.

MONTANA: Helena, Oct. 6. Sec., Dr. Otto G. Klein, First National Bank Bldg., Helena.

NEW HAMPSHIRE: Concord, Sept. 10-11. Sec., Board of Registration in Medicine, Dr. T. P. Burroughs, State House, Concord.

NEW JERSEY: Trenton, Oct. 20-21. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: * Santa Fe, Oct. 13-14. Sec., Dr. LeGrand Ward, 135 Sena Plaza, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Sept. 14-17. Chief, Bureau of Professional Examinations, Mr. H. L. Field, State Education Department, 315 Education Bldg., Albany.

NORTH CAROLINA: December. Sec., Dr. W. D. James, Hamlet.

OHIO: *Endorsement.* Oct. 6. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: * Oklahoma City, Dec. 9. Sec., Dr. J. D. Osborn, Jr., Frederick.

PENNSYLVANIA: Philadelphia, January. Act. Sec., Bureau of Professional Licensing, Mrs. Marguerite G. Steiner, Department of Public Instruction, 358 Education Bldg., Harrisburg.

RHODE ISLAND: * Providence, Oct. 1-2. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

TEXAS: Austin, Dec. 28-30. Sec., Dr. T. J. Crowe, 918-20 Texas Bank Bldg., Dallas.

UTAH: Salt Lake City, June. Dir., Department of Registration, Mr. G. V. Billings, 324 State Capitol Bldg., Salt Lake City.

VIRGINIA: Richmond, Dec. 8-11. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WEST VIRGINIA: Charleston, Oct. 26-28. Commissioner, Public Health Council, Dr. C. F. McClintic, State Capitol, Charleston.

WISCONSIN: * *Reciprocity.* Madison, September. Sec., Dr. H. W. Shutter, 425 E. Wisconsin Ave., Milwaukee.

WYOMING: Cheyenne, Oct. 5-6. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: Tucson, Sept. 15. Act. Sec., Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson.

CONNECTICUT: Oct. 10. Address State Board of Healing Arts, 1945 Yale Station, New Haven.

DISTRICT OF COLUMBIA: Washington, Oct. 19-20. Sec., Commission on Licensure, Dr. George C. Ruhland, 6150 East Municipal Bldg., Washington.

FLORIDA: Gainesville, Oct. 31. Application must be on file not later than Oct. 16. Sec., Dr. J. F. Conn, John B. Stetson University, DeLand.

IOWA: Des Moines, Oct. 14 Dir., Division of Licensure & Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

MINNESOTA: Minneapolis, Oct. 6-7. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis.

NEBRASKA: Lincoln, Oct. 6-7. Dir., Bureau of Examining Boards, Mrs. Jeannette Crawford, 1009 State Capitol Bldg., Lincoln.

NEW MEXICO: Albuquerque, Feb. 1. Sec., Miss Pia Joerger, State Capitol, Santa Fe.

OKLAHOMA: Oklahoma City, May. Sec., Dr. Oscar C. Newman, Shattuck.

OREGON: Portland, Oct. 31. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

SOUTH DAKOTA: Sioux Falls, Dec. 4-5. Sec., Dr. G. M. Evans, Yankton.

WISCONSIN: Madison, Sept. 19. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee.

Missouri Reciprocity Report

The State Board of Health of Missouri reports 8 physicians licensed to practice medicine by reciprocity and 1 physician so licensed on endorsement of credentials of the National Board of Medical Examiners on January 22 and May 15. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Rush Medical College		(1936)	Illinois
University of Kansas School of Medicine		(1939)	Kansas
University of Minnesota Medical School		(1931)	Minnesota
Washington University School of Medicine		(1938)	Illinois
Albany Medical College		(1904)	New York
Long Island College of Medicine		(1925)	Illinois
McGill University Faculty of Medicine		(1934)	Connecticut
Medizinische Fakultät der Universität Wien		(1935)	Texas

School	LICENSED BY ENDORSEMENT	Year Grad.
University of Illinois College of Medicine		(1941)

Wyoming Endorsement Report

The Wyoming State Board of Medical Examiners reports 5 physicians licensed to practice medicine by endorsement on February 2. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
University of Colorado School of Medicine		(1934)	Colorado
Creighton University School of Medicine		(1930)	Nebraska
Long Island College of Medicine		(1929)	New York
University of Oklahoma School of Medicine		(1927)	Oklahoma
University of Pennsylvania School of Medicine		(1927)	S. Dakota

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Osteopathy: Registration of Osteopaths Under Harrison Narcotic Act; Lawful Scope of Osteopathic Practice.—In a Kansas case, osteopaths were refused registration under the Harrison Narcotic Act, and the Kansas State Osteopathic Association, Inc., and certain licensed osteopaths commenced an action against the United States collector of internal revenue to compel registration. The trial court gave judgment for the osteopaths and the collector appealed to the United States circuit court of appeals, tenth circuit.

The issue in this case, said the court, was whether or not osteopaths under the laws of Kansas have the right to administer narcotic drugs, and that issue must be determined by the state law as construed by the Kansas courts. On three separate occasions, the court pointed out, the Supreme Court of Kansas has had the opportunity to define the limits within which osteopaths may practice and in each instance reached the conclusion that osteopathy was a drugless, manipulative system of healing. The plaintiffs in this action contended, however, that, since osteopaths in Kansas are authorized to practice osteopathy as taught and practiced in the legally incorporated colleges of osteopathy of good repute, they are entitled to use narcotics if instruction in their use is given in such schools. But, the court said, merely studying the use of narcotics in school does not authorize an osteopath to use them in his practice for "the fact that in an osteopathic college the broad principles of medicine and surgery were investigated and considered, merely for the purpose of giving the student body a knowledge of what those who practice medicine and surgery believe, would not be sufficient to conclude that those licensed to practice osteopathy would have the right to practice medicine or surgery."

The plaintiffs further contended that under the court decisions in Kansas osteopaths were precluded from using drugs as "remedial aids" but not from using them for palliative purposes. The circuit court of appeals, while admitting that the term "remedial aids" as used by the Supreme Court of Kansas was ambiguous, pointed out that judges are not skilled in the science of medicine nor in the intricate and delicate shades of meaning of medical terms. When the osteopaths were licensed to practice in Kansas, the court continued, their therapy was designed to relieve pain and other illness by means of manipulation and without the use of drugs, as indicated by statements from their leaders. It was on the strength of that claim that the legislature granted them the privilege of practicing. If they have now found that their osteopathic therapy will not relieve pain and that they must use narcotics or other drugs to effect that relief, that need should be addressed to the legislature rather than the courts. The circuit court of appeals concluded, therefore, that since the laws of Kansas prohibited the use, sale or distribution of narcotic drugs for any purpose by an osteopath, such practitioners were not entitled to registration under the Harrison Narcotic Act. The judgment of the lower court was reversed and the cause remanded, with instructions to dismiss the bill.

In a Nebraska case, the attorney general filed a suit to enjoin the defendant osteopath from practicing medicine and operative surgery and from publicly professing to be a physician, surgeon or obstetrician. Judgment was entered for the defendant in the trial court and the attorney general appealed to the Supreme Court of Nebraska.

The character and general duties of occupations classed as professions are to be determined as questions of fact of which judicial notice will be taken, said the Supreme Court. Whether a specific act constitutes the practice of osteopathy is not therefore subject to proof by expert witnesses. Furthermore, the general rule of pleading which admits as true all facts well pleaded on the filing of a general demurrer or a motion for a judgment on the pleadings has no application to the facts of which a court may take judicial notice, and such demurrer or motion does not therefore admit a conclusion of law deduced from such facts. An osteopath is defined by the laws of Nebraska as a person who treats human ailments "by that system of the healing art which places the chief emphasis on the structural integrity of the body mechanism as being the most important factor for maining [maintaining] the organism in health." He is authorized "to practice osteopathy in all its branches, as taught in the osteopathic colleges recognized by the American Osteopathic Association." To determine the meaning of the term osteopathy the court resorted to the definitions and descriptions of it given by the founder of the practice, by those who teach and practice it, by the lexicographers and by the courts and concluded that the system of osteopathy as thus defined and described does not embrace the use of drugs or the use of a knife. The defendant argued, however, that since general surgery, orthopedic surgery, anatomy, pathology and other subjects are included in the required course of study in an accredited school of osteopathy, their practice is included in the statutory authorization. The court said that the words of the statute are not subject to the construction that they authorize an osteopath to practice everything that is taught in an osteopathic school. The statute contains expressions which have a limiting as well as an authorizing effect. The practice authorized must be osteopathic and it must also be taught in accredited osteopathic colleges. The fact that branches of medicine and surgery may be taught to increase the knowledge of the student in the anatomy and functions of the various parts of the human body for the purpose of better fitting him to practice osteopathy will not warrant him in invading those fields on the theory that they constitute the practice of osteopathy. The scope of osteopathy, the court pointed out, is well known and schools or colleges of osteopathy must stay within its boundaries; they cannot enlarge them. An osteopath's knowledge must be broader than his practice; he must know what he practices but may not practice all he knows.

The fact that the defendant's license used the description "osteopathic physician and surgeon" did not authorize him to engage in operative surgery, in the opinion of the court. The word surgery when used in connection with osteopathy means surgery by manual manipulation and was never meant to include operative surgery. The practice of osteopathy and operative surgery have long been recognized as two separate and distinct things. The further fact that the law under which the defendant received his license provided that "osteopathic physicians shall perform only such operations in surgery as was fully taught in the school or college of which the applicant is a graduate at the time of his attendance" did not constitute a legislative recognition that operative surgery is a branch of osteopathy. Here again the court said that the word surgery must be construed as referring to operations in surgery consistent with the practice of osteopathy as originally defined, which excludes the practice of operative surgery in its commonly accepted meaning. The defendant urged, however, that the principles of osteopathy have changed and that experience and learning have produced certain advances that must be recognized. If osteopathy has changed merely by a self-serving attempt to broaden its scope by invading fields requiring a different license, the court remarked, the legislature of Nebraska has never recognized any such additions to the profession. If the changes have been the result of advances in the profession, they still constitute the practice of osteopathy. But the practice of operative surgery by an osteopath constitutes an invasion of the field of the physician and surgeon as it is generally known and is not an evolutionary advancement of the profession of osteopathy.

As to the practice of obstetrics by osteopaths, the court pointed out that the right to engage in such practice was not specifically granted by the statute authorizing the licensing of osteopaths. It was not disputed that the defendant graduated from an accredited school of osteopathy in which obstetrics was taught. The defendant was also required to pass an examina-

tion in that subject. In this respect, in the opinion of the court, the defendant was in no better position than he was as to the right to practice operative surgery. The court felt required, however, to examine the laws of Nebraska to determine to what extent, if any, "they have modified this position." Under the provisions of an act passed in 1901, an osteopath was required to report births to the proper authorities. A similar provision was continued in the 1905, 1909 and 1919 revisions of the osteopathic act. In 1927 the specific requirement that an osteopath must file a birth certificate was deleted, but another law provided that a birth certificate must be filed by the "physician" in attendance. While, in the opinion of the court, the fact that the defendant was required to have pursued a course in obstetrics and to have passed an examination in the subject would not alone authorize him to engage in the practice of obstetrics, yet, when considered in connection with the law requiring the reporting of births, there was evident a legislative recognition that obstetrics constitutes a branch of osteopathy, that the use of the word "physician" in the 1927 law relating to the reporting of births was intended to include regularly licensed osteopathic physicians and that osteopaths could therefore engage in the practice of obstetrics.

With respect to the use of anesthetics by an osteopath, the act of 1919 under which the defendant was licensed specifically authorized a licentiate to use anesthetics, antiseptics, antidotes for poisons and narcotics for temporary relief of suffering. A revision of this act in 1927 eliminated this specific authorization and conferred on osteopaths in general terms the right to practice osteopathy in all its branches as taught in the osteopathic colleges recognized by the American Osteopathic Association. The court did not think that the 1927 revision manifested any legislative intent to deprive the defendant of his previously acquired privilege to use the drugs named. The court was inclined to feel that when a legislative act grants a privilege, a subsequent enactment will not be construed to deprive the beneficiary of that privilege unless a legislative intent to do so is clearly apparent from the legislation itself. The court held, therefore, that the defendant was entitled to use anesthetics by virtue of his license to practice osteopathy.

The court concluded that the trial court erred in not granting an injunction restraining the defendant from engaging in the practice of operative surgery and from publicly holding himself out as licensed and otherwise qualified to perform operative surgery with surgical instruments. In all other respects the judgment of the trial court was held to be correct.—*Burke, Collector of Internal Revenue v. Kansas State Osteopathic Association, Inc., 111 F. (2d) 250 (1940); State ex rel. Johnson, Atty. Gen. v. Wagner, 297 N. W. 906 (Neb., 1941).*

Malpractice: Keratitis Attributed to Failure to Remove Foreign Particles from Eye.—On July 31, 1937, the plaintiff sustained an injury to his eye caused by a piece of cement which fell from the ceiling directly above where he was working. Some of the small particles of cement apparently remained in the eye. A few days later he went to the office of the defendant physician for treatment. He continued working until August 20, when without again consulting the defendant he left on a pleasure trip. The eye continued to cause him pain and on October 28, while visiting in another state, he consulted an optometrist, complaining of frontal headaches. The optometrist did not make an ophthalmoscopic examination but found the eye and vision to be normal and instructed the plaintiff to return in ten days. The plaintiff did not comply with this instruction and returned to his home state about November 1. He testified that his eye was still giving him trouble at that time but that he did not again report to the defendant physician until November 22. At this time some controversy arose between the plaintiff and the defendant because the latter had considered the case closed, as the plaintiff had not returned for further treatment and the defendant had already submitted a statement for his services, which had been paid, this being a workmen's compensation case. Attributing the condition of his eye to a failure on the part of the defendant to remove all of the particles of cement from it, the plaintiff sued the defendant for malpractice. The trial court directed a verdict in favor of the physician and the plaintiff appealed to the Supreme Court of Colorado.

All of the physicians who treated the plaintiff during the six months following his last visit to the defendant agreed, said the Supreme Court, that the eye trouble was due to keratitis, but none of them discovered any foreign particles in the eye until June 5, 1938, ten months after the accident, and the then examining physician could not identify the foreign bodies. There was testimony to the effect that between Aug. 5, 1937 and June 5, 1938 the plaintiff did have other foreign particles in his eye, on at least two occasions. There was no testimony in the record to indicate that any foreign particles which may have gotten into the plaintiff's eye at the time of the accident remained there after his visit to the defendant on August 5, and even if they had so remained, the court observed, the expert testimony was to the effect that keratitis was not caused by trauma but rather was a systemic infection. The undisputed testimony was that the plaintiff's eye condition showed striking improvement while he was being treated on the theory that the disease was due to a systemic infection and during the time concerning which his principal witness testified that there were foreign particles in the eye. This same witness also stated that, if keratitis did not develop within three months after the occurrence of the trauma, trauma would have to be ruled out as a cause.

Without any evidence of the presence of cement particles in the eye after the plaintiff's visit to the defendant, the jury, in the opinion of the court, would have been left entirely to conjecture as to the cause of the condition of the eye, and while the one principal witness for the plaintiff indicated a possibility of a causal relationship he stated emphatically that he had never stated that the defendant caused the keratitis. Even assuming that there was such a causal relationship as the plaintiff contended, the court said that it would be impelled to hold that he, the plaintiff, was guilty of contributory negligence as a matter of law if his statement was accepted as a fact that although dissatisfied with his treatment on August 5 he did not consult another physician for nearly three months thereafter. The court therefore affirmed the judgment for the defendant.—*Hanley v. Spencer, 115 P. (2d) 399 (Colo., 1941).*

Medical Practice Acts: Revocation of License for Fraud and Deceit.—The Florida State Board of Medical Examiners revoked the petitioner's license to practice medicine on the ground that he had been guilty of fraud and deceit in his application for a license. The revocation order was reversed in the circuit court and the board appealed to the Supreme Court of Florida.

The charge presented to the board alleged that the petitioner, in his application for a license, stated "That I have never, or will never, procure or aid, or abet in procuring a criminal abortion and in the event I am ever called to attend a case of abortion or miscarriage, I will call a reputable consultant to advise with me," when at the time he knew that in 1927 the California Board of Medical Examiners had adjudged him guilty of performing criminal abortions. The charge, said the Supreme Court, was insufficient in that it did not allege that the petitioner had been guilty of "The procuring or aiding or abetting in procuring a criminal abortion," one of the grounds for revocation set forth in the medical practice act, but instead alleged that the petitioner "had been adjudged guilty of performing criminal abortions by the California Board of Medical Examiners of California about June 29th 1927." We cannot hold, continued the court, that such allegation constitutes a ground for the revocation of a physician's license under the medical practice act. The court then pointed out, however, that it was not contended that proof had been made in this case that the petitioner had been guilty of the act denounced by the statute. The contention was that the petitioner committed a fraud on the state board of medical examiners when he procured his license in the state without advising the board of the

action theretofore taken by the California board. The court said that there was nothing in the statutes or in the application adopted by the board which required the petitioner to make such matter known, unless he had been guilty of the act denounced by the statute. Fraud cannot be inferred or deduced from the nonperformance of acts which by law the petitioner is not required to do whatever may be his motive, design or purpose either in doing or not doing the acts complained of.

If the Florida State Board of Medical Examiners had had before it the record of the evidence taken and acted on by the California board, the court said, and, on consideration of that evidence, had found the petitioner guilty, such finding could possibly have been upheld. But here the Florida board assumed to act on the conclusions reached by the California board. If there had been a judgment of a California court of competent jurisdiction, the court continued, adjudging the petitioner guilty of the offense, copy of such judgment properly authenticated would have been entitled to full faith and credit and would have set at rest the question of guilt.

From an inspection of the whole record, the court failed to find that in the original application for a license the petitioner had made any false statements and therefore held that no reversible error was disclosed. Accordingly, the judgment of the circuit court was affirmed.—*State Board of Medical Examiners v. Morlan, 3 So. (2d) 402 (Fla., 1941).*

Charitable Hospitals: Liability for Taxes.—A Maine law exempts from taxation the property of benevolent and charitable institutions incorporated by the state, with a proviso that "so much of the real estate of such corporations as is not occupied by them for their own purposes shall be taxed in the municipality in which it is situated." In the Calais Hospital case, the hospital was incorporated in 1938 as a charitable and benevolent institution. In 1939 a real estate tax was assessed on the property of the hospital, and after the assessor had refused to abate the tax the matter came before the Supreme Judicial Court of Maine.

The defendant conceded that the hospital was in its legal conception charitable. It was contended, however, that not all of the hospital building was occupied by the hospital for its own purposes and that the portion not so used was taxable. The basis of this contention was that a room in the hospital building was used by a physician as his office in connection with his private professional practice for his personal gain and that this constituted the dominant use of that portion of the property and thus subjected that portion to taxation. The evidence showed that the physician was the treasurer and manager of the hospital and that the room constituted his headquarters in connection with his services to the institution; that there was no setting aside of the room for his exclusive personal use and that it was a matter of mutual convenience, enabling the physician to continue the practice of his profession without detriment to hospital service and of advantage to the hospital because of the greater facility afforded the physician with reference to the performance of his managerial duties. The physician received no compensation from the hospital and the hospital received no rental income.

An arrangement as to the use of one room in the building which benefited the institution in carrying forward its work without additional expense and segregated no portion to the exclusive use of another but left the hospital in dominant control did not, in the opinion of the court, constitute a use which was independent of and alien to the normal functions of the hospital even though it was also of advantage to the physician. In the opinion of the court, there was sufficient evidence that the hospital was incorporated and conducted as a charitable and benevolent institution and that there was an actual appropriation of all its property for its own purposes. The court therefore held that the real estate tax should not have been assessed and entered judgment in favor of the hospital.

In a second Maine case, the Supreme Judicial Court held that a vacant lot owned by a hospital on which it was intended to construct a nurses' home and solarium but which at the present time was not in actual use except as patients and nurses walked thereon and occupied chairs under the trees was "occupied for its purposes" by the hospital within the meaning of the Maine statute and was therefore exempt from taxation.—*Calais Hospital v. City of Calais, 24 A. (2d) 489 (Maine, 1942); Osteopathic Hospital of Maine, Inc. v. Inhabitants of City of Portland, 26 A. (2d) 641 (Maine, 1942).*

Malpractice: Chiropractic Treatment of Epilepsy; Discontinuance of Drug Therapy.—In this case the plaintiff sued the defendant chiropractor for malpractice. The trial court instructed the jury to return a verdict for the defendant at the close of the plaintiff's evidence and entered judgment on that verdict after overruling a motion for a new trial. The plaintiff thereupon appealed to the Court of Appeals of Ohio, Hamilton County.

The plaintiff had been afflicted with epilepsy for twenty years or more. It was a type the cause of which was unknown, and there was no known cure. The use of phenobarbital, however, which had been used by the plaintiff for many years, reduced the frequency and the intensity of the convulsions. The plaintiff became dissatisfied with the palliative treatment and sought a cure from the defendant chiropractor. In going to the chiropractor, the court pointed out, the plaintiff manifestly did so for chiropractic treatment. He received that treatment from the defendant, who manipulated his spinal column. There was no claim that the manipulation resulted in any harmful effects. It was asserted, however, that the discontinuance of the use of phenobarbital resulted in the convulsions being more frequent and more intense and that the discontinuance of the drug was by direction of the chiropractor. But, the court pointed out, the plaintiff knew when he went to the defendant that chiropractors did not believe in the curative quality of drugs and relied solely on manipulation to accomplish beneficial results. It seemed to the court, therefore, that the plaintiff submitted voluntarily to the discontinuance of the use of phenobarbital with full knowledge of the consequences in the hope that the chiropractic treatment would effect a cure and that the familiar principle of the common law *volenti non fit injuria,* or to the consenting no injury is done, prevented a recovery of damages for the added suffering resulting from the discontinuance of the drug. The judgment for the defendant was therefore affirmed. —*Kirschner v. Keller, 42 N. E. (2d) 463 (Ohio, 1942).*

Society Proceedings

COMING MEETINGS

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, White Sulphur Springs, W. Va., Sept. 10-12. Dr. James R. Bloss, 418 Eleventh St., Huntington, W. Va., Secretary.

American Congress of Physicial Therapy, Pittsburgh, Sept. 9-12. Dr. Richard Kovacs, 2 East 88th St., New York, Secretary.

American Roentgen Ray Society, Chicago, Sept. 15-18. Dr. H. Dabney Kerr, University Hospitals, Iowa City, Secretary.

Colorado State Medical Society (House of Delegates only), Denver, Sept. 23-24. Mr. Harvey T. Sethman, 1612 Tremont Place, Denver, Executive Secretary.

District of Columbia, Medical Society of the, Washington, Sept. 29-Oct. 1. Mr. Theodore Wiprud, 1718 M St. N.W., Washington, Secretary.

Idaho State Medical Association, Sun Valley, Sept. 16-19. Dr. F. B. Jeppesen, 105 North 8th St., Boise, Secretary.

Indiana State Medical Association, French Lick, Sept. 29-Oct. 1. Mr. T. A. Hendricks, 23 East Ohio St., Indianapolis, Executive Secretary.

Kentucky State Medical Association, Louisville, Sept. 27-Oct. 1. Dr. Arthur T. McCormack, 620 South Third St., Louisville, Secretary.

Michigan State Medical Society, Grand Rapids, Sept. 22-25. Dr. L. Fernald Foster, 2020 Olds Tower, Lansing, Secretary.

Nevada State Medical Association, Reno, Sept. 24-26. Dr. Horace J. Brown, 120 North Virginia St., Reno, Secretary.

Oregon State Medical Society, Portland, Sept. 9-11. Dr. John R. Montague, 1020 S.W. Taylor St., Portland, Secretary.

Pennsylvania, Medical Society of the State of, Pittsburgh, Oct. 5-8. Dr. Walter F. Donaldson, 500 Penn Ave., Pittsburgh, Secretary.

Utah State Medical Association, Provo, Aug. 27-29. Dr. D. G. Edmunds, 610 McIntyre Bldg., Salt Lake City, Secretary.

Vermont State Medical Society, Montpelier, Oct. 1. Dr. Benjamin F. Cook, 154 Bellevue Ave., Rutland, Secretary.

Virginia, Medical Society of, Roanoke, Oct. 5-7. Miss Agnes V. Edwards, 1200 East Clay St., Richmond, Secretary.

Washington State Medical Association (House of Delegates only), Seattle, Sept. 12-13. Dr. V. W. Spickard, 1305 Fourth Ave., Seattle, Secretary.

Wisconsin, State Medical Society of, Milwaukee, Sept. 16-18. Mr. Charles H. Crownhart, 110 East Main St., Madison, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

11:421-488 (June) 1942

Biliary Diseases as Seen by a Surgeon. H. B. Stone, Baltimore.—p. 421.

Treatment of Heart Disease Without Special Technical Equipment. J. B. McLester, Birmingham.—p. 425.

Newer Treatment for Perennial Hay Fever. R. M. Clements, Tuscaloosa.—p. 428.

American Heart Journal, St. Louis

23:591-738 (May) 1942

Graphic Registration of Normal Heart Sounds. M. B. Rappaport and H. B. Sprague, Boston.—p. 591.

*Observations on Effect of Tourniquets on Acute Cardiac Crises, Normal Subjects and Chronic Heart Failure. W. B. Kountz, J. R. Smith and S. T. Wright, St. Louis.—p. 624.

Influence of Xanthine Drugs and Atropine on Mortality Rate After Experimental Occlusion of Coronary Artery. G. V. LeRoy, G. K. Fenn and N. C. Gilbert, Chicago.—p. 637.

Critique of Plethysmographic Method of Measuring Blood Flow in Extremities of Man. M. Landowne and L. N. Katz, Chicago.—p. 644.

Internal Pneumocardiogram. A. Luisada, Boston.—p. 676.

Electrocardiographic Changes in Bronchial Asthma and Their Significance. J. Harkavy and A. Romanoff, New York.—p. 692.

Recent Myocardial Infarction Followed by Involvement of Joints of Hand and Wrist: Report of Three Cases. J. C. Meyer and H. F. Binswanger, Chicago.—p. 715.

Coronary Disease in Ape. G. W. Manning, Toronto, Canada.—p. 719.

Effect of Tourniquets on Acute Cardiac Crises.—According to Kountz and his associates, rapid lowering of venous pressure by phlebotomy may bring about pronounced relief and rapid recovery of myocardial function in acute cardiac dyspnea. Phlebotomy has been hailed as a life saving procedure in left ventricle failure, especially in the presence of venous engorgement. Danzer thought that a similar effect might be obtained by the application of pneumatic tourniquets to the extremities, utilizing the peripheral venous system as a reservoir to decrease the circulating blood volume. He reported a dramatic relief of symptoms from this procedure in some cases of acute cardiac failure. Advantages of the method over venesection are self evident. More blood can be removed from circulation by utilizing the peripheral venous tree as a reservoir than would be desirable by bleeding alone. Another advantage is that a large quantity of blood may be retained "in storage" for a long time. There is the disadvantage that it tends to cause venous dilatation and thus might favor venous thrombosis and possibly emboli. The authors studied the effect of peripheral venous congestion in normal persons and in a group with heart disease by means of an instrument which inflated and deflated cuffs placed on the arms and thighs in rotation. In both groups rhythmic inflation of the cuffs caused a fall in venous pressure, diminution of cardiac contraction and a fall in cardiac output; the arterial pressures remained essentially unchanged. In normal persons some enlargement of the heart occurred during rhythmic constriction of the extremities; in patients with hypertensive heart disease the size of the heart usually remained unchanged, but in 2 instances the heart diminished slightly in size. The procedure may be useful in the treatment of acute myocardial infarction as well as in paroxysmal cardiac dyspnea. It appears to be of no benefit in right ventricular failure.

American Journal of Clinical Pathology, Baltimore

12:241-282 (May) 1942

*Hemolytic Transfusion Reactions: II. Prevention, with Special Reference to a New Biologic Test. A. S. Wiener, Brooklyn; I. J. Silverman and W. Aronson, New York, with the technical assistance of Eve Sonn and Marjorie Weingarten.—p. 241.

Chloride Metabolism in Pneumonia: Blood and Urinary Chloride Studies in Sulfathiazole Treated Pneumonias and Early Rapid Excretion of Chloride in Pneumonia. J. A. Oshlag and M. Eil, New York.—p. 249.

Lymphatic Leukemia and Tuberculosis. J. E. Farber and H. Bylebyl, Buffalo.—p. 253.

Blood Galactose Tolerance Test. D. R. Meranze, W. B. Likoff and N. G. Schneeberg, Philadelphia.—p. 261.

Participation of Reticulum in Case of Monocytic Leukemia, Associated with Urogenital Malformation. E. J. Eichwald, Dayton, Ohio.—p. 272.

Sudden Death: Neurocirculatory Disturbance. B. Markowitz, Bloomington, Ill.—p. 276.

Hemolytic Transfusion Reactions.—Wiener and his co-workers describe a test to be employed in cases in which the possibility of intragroup incompatibility is suspected: One hundred cc. of the prospective donor's blood is mixed with 10 cc. of 3.8 per cent solution of dihydric sodium citrate; 10 cc. of blood is drawn from the patient and divided between two tubes, one empty and the other containing 1 cc. of the citrate solution. Through the same needle 50 cc. of the donor's blood is injected by syringe into the patient. After one hour 10 cc. of blood is again drawn from the patient and treated in the same way as the pretransfusion sample. The citrated blood samples are centrifuged at once and the color of the plasma in the two tubes is compared. The serums from the clotted blood samples are later separated; this serves as a check on the results of the citrated samples of blood. If there is no change in the appearance of the patient's plasma and the need for blood is urgent, a large transfusion can be given. If time permits, it is preferable to inject another test dose of 50 cc. of the donor's blood and to draw a third sample of blood from the patient after an additional hour. In this way more reliable results can be obtained. The reaction in positive cases is more striking; in one hour after the test injection of 50 cc. of blood the patient may have a severe chill and a rise in temperature, but more reliance is to be placed on the appearance of the patient's plasma, which will show a distinct rise in the icteric index as compared to the pretransfusion sample. If only bank blood is available, no sample more than three days old should be used.

American J. Digestive Diseases, Fort Wayne, Ind.

9:181-210 (June) 1942

Indeterminate Fever Caused by Perirectal Abscess. W. Weisel, E. G. Wakefield and N. D. Smith, Rochester, Minn.—p. 181.

Intravenous Modification of Hippuric Acid Test of Liver Function. R. H. Moser, B. D. Rosenak, Indianapolis, and R. J. Hasterlik, Evanston, Ill.—p. 183.

*Etiology of Acute Pancreatitis. H. L. Popper, Chicago.—p. 186.

Fear and Gastric Acidity. F. Hoelzel, Chicago.—p. 188.

*Vitamin Survey of Normal Industrial Workmen. J. G. Schnedorf, C. J. Weber and L. Clendening, Kansas City, Kan.—p. 188.

Superficial Ulcerative Gastritis Following Tryparsamide Therapy for Syphilis. I. H. Einsel, Cleveland.—p. 191.

Gastrojejunocolic Fistula. J. J. Stein, Hines, Ill.—p. 192.

Duodenocolic and Gastrojejunocolic Fistula; Complication of Carcinoma: Report of Two Cases. M. Feldman, Baltimore.—p. 195.

Trichobezoar: Report of Case. J. S. Levy and R. T. Smith, Little Rock, Ark.—p. 198.

Cellulose Splitting Micro-Organisms in Human Feces. Nell Hirschberg, Chicago.—p. 200.

Influence of Certain Commonly Used Drugs on Rate of Gastric Emptying in Normal Human Subject as Determined by an Intubation Technic (Atropine, Morphine, Benzedrine, Prostigmine, Nitroglycerin, Syntropan, Mecholyl, Ergotamine Tartrate and Sodium Bicarbonate). J. H. Folley and W. O. Abbott, Philadelphia.—p. 202.

Some Factors Concerned in Production of Experimental Ulceration of Gastrointestinal Tract in Cats. M. J. Schiffrin and Althea A. Warren, Montreal, Canada.—p. 205.

Etiology of Acute Pancreatitis.—Popper made enzyme determinations of aspirated gallbladder bile from 164 patients operated on for gallbladder disease and from 36 operated on for other abdominal disease. In the latter group a normal bile system was found at operation. Pancreatic enzymes were present in the bile in 10 per cent of all cases, suggesting that

in these a common channel was present through which pancreatic reflux into the biliary system was made possible. He has tried another approach to this question by analyzing bile from 18 patients with acute pancreatitis for the presence of pancreatic enzymes. In 16 pancreatic enzymes were found in the bile. Evidence for the existence of common channel formation between bile and pancreatic ducts was thus present in 89 per cent of the patients with acute pancreatitis. A reflux of pancreatic juice into the bile passages was found in 3 with normal bile passages. Evidence of a common channel was present in mild pancreatitis as well as in pancreatic necrosis, indicating that the different types of acute pancreatitis may be caused by the same pathogenic mechanism.

Vitamin Survey of Normal Industrial Workmen.—Schnedorf and his co-workers report the results of a vitamin survey of 1,265 healthy men 20 to 65 years of age engaged in industrial labor. Only 1 man was found to have had rickets during childhood. A detailed dietary and symptomatic history revealed that 24 of 300 had a diet inadequate in vitamin A. However, no instance of subclinical vitamin A deficiency was observed. There were no instances of xerophthalmia, night blindness or hyperkeratotic cutaneous papules. No cases of muscular pains, paresthesia and polyneuritis suggesting vitamin B_1 deficiency were seen. Gastrointestinal symptoms (gas, heartburn and dyspepsia) were reported by 52 of the 300 questioned, but none were severe enough to cause a defective vitamin B absorption, nor could they be conclusively attributed to vitamin B_1 deficiency. Pigmented dermatitis, soreness of the mouth, redness of the tongue, indigestion, diarrhea and disturbances of the central nervous system suggesting subclinical pellagra were not observed. Cheilosis and conjunctivitis characteristic of riboflavin deficiency were not noted. Blood plasma ascorbic acid determinations on 78 of the normal workmen revealed only 13 with a level of more than 0.75 mg. per hundred cubic centimeters, while 64 per cent had a plasma level of less than 0.5 mg. The blood plasma ascorbic acid level correlated with the dietary intake of vitamin C. None showed any signs or symptoms of vitamin C deficiency and all were in good health and able to do industrial work. These observations indicate that plasma ascorbic acid saturation is not necessary for good health and that signs of scurvy will not develop even with plasma levels ranging from 0.1 to 0.5 mg. There is no well controlled experimental evidence on human subjects which proves that tissue and plasma ascorbic acid saturation is necessary for normal good health. Amounts smaller than the 60 to 80 mg. of vitamin C advocated appear to be compatible with good health. The increasing reports on the widespread prevalence of vitamin deficiency disease and its deleterious effect on health should not be viewed with too great alarm.

American Journal of Physiology, Baltimore

136:223-350 (April) 1942. **Partial Index**

Urine Dilution and Concentration Tests in Adrenalectomized Dogs. F. J. Kottke, C. F. Code and E. H. Wood, Minneapolis.—p. 229.

Observations on Accuracy of Thermostromuhr. D. E. Gregg, W. H. Pritchard, R. W. Eckstein, R. E. Shipley, A. Rotta, J. Dingle, T. W. Steege and J. T. Wearn, Cleveland.—p. 250.

Operative Mechanism of Some Errors in Application of Thermostromuhr Method to Measurement of Blood Flow. R. E. Shipley, D. E. Gregg and J. T. Wearn, Cleveland.—p. 263.

Homeostatic Role of Renal Humoral Mechanism in Hemorrhage and Shock. A. S. Hamilton and D. A. Collins, Philadelphia.—p. 275.

Effect of Cream Meal on Acidity and Neutralizing Ability of Contents of Duodenal Bulb in Normal Dogs. J. E. Berk, J. E. Thomas and M. E. Rehfuss, Philadelphia.—p. 285.

Plasma Protein Replacement After Hemorrhage in Dogs With and Without Shock. R. V. Ebert, E. A. Stead Jr., J. V. Warren and W. E. Watts, Boston.—p. 299.

Relation of Pituitary, Thyroid and Adrenal Glands to Maintenance of Normal Serum Albumin and Globulin Levels. L. Levin and J. H. Leathem, New York.—p. 306.

Linear Relationship Between Circulating Red Cell Mass and Venous Hematocrit as Determined with Radioactive Iron. P. F. Hahn and W. F. Bale, Rochester, N. Y.—p. 314.

Influence of Bile Salts on Active Intestinal Absorption of Chloride. H. C. Peters, Memphis, Tenn.—p. 340.

Effect of Low Potassium Diet and of Desoxycorticosterone Acetate on Renal Size. S. H. Durlacher, D. C. Darrow and M. C. Winternitz, New Haven, Conn.—p. 346.

American Journal of Public Health, New York

32:457-576 (May) 1942

Mock Epidemic of Typhoid Fever Used in Public Health Training. G. B. Darling, Battle Creek, Mich., and L. A. Fox, Washington, D. C.—p. 457.

Bacteriologic Indexes of the Sanitary Quality of Market Cream. Elizabeth D. Robinton, E. K. Borman and F. L. Mickle, Hartford, Conn.—p. 464.

Nasopharyngeal Swab in Diagnosis of Pertussis. T. M. Saito, J. J. Miller Jr. and C. W. Leach, San Francisco.—p. 471.

Comparison of Methods for Determination of Carbon Monoxide. F. H. Goldman and A. D. Brandt, Bethesda, Md.—p. 475.

Blood Lead Determinations as a Health Department Laboratory Service. E. Kaplan and J. M. McDonald, Baltimore.—p. 481.

House Fly as a Vector of Food Poisoning Organisms in Food Producing Establishments. M. Ostrolenk and H. Welch, Washington, D. C.—p. 487.

Training of Medical Personnel in Syphilis Control. W. W. Frye, R. H. Kampmeier and A. E. Keller, Nashville, Tenn.—p. 495.

Human Equine Encephalomyelitis and St. Louis Encephalitis in California, 1939 to 1941. Beatrice F. Howitt, San Francisco.—p. 503.

Tuberculosis Case Finding in Institutional Populations: Use of 35 mm. Fluorograms Among the Mentally Ill. H. E. Hilleboe, St. Paul; R. B. Haas, Miami, Fla.; C. E. Palmer, Bethesda, Md., and W. P. Gardner, Anoka, Minn.—p. 516.

Industrial Nutrition and National Emergency. H. Borsook, Pasadena, Calif.—p. 523.

Role of Public Health in the National Emergency. F. J. Underwood, Jackson, Miss.—p. 529.

32:577-680 (June) 1942

The Index Person—Relation to Incidence Rates in Family Studies. R. L. Gauld, L. J. Reed and Margaret Merrell, Baltimore.—p. 577.

Family Records in Health Department. G. H. Ramsey and Marjorie T. Bellows, White Plains, N. Y.—p. 585.

Illness in Chronic Disease Family. Jean Downes, New York.—p. 589.

Use of Index Case in Study of Tuberculosis in Williamson County. Ruth R. Puffer, Nashville, Tenn.; J. A. Doull, Cleveland; R. S. Gass, W. J. Murphy, Franklin, Tenn., and W. C. Williams, Nashville, Tenn.—p. 601.

Connecticut State Department of Health Mental Hygiene Program. J. M. Cunningham, Hartford, Conn.—p. 606.

Expanded Role of the Sanitarian. H. A. Kroeze, Jackson, Miss.—p. 611.

*Use of Alum Treated Pertussis Vaccine and of Alum Precipitated Combined Pertussis Vaccine and Diphtheria Toxoid for Active Immunization. Pearl L. Kendrick, with statistical analysis by E. S. Weiss, Grand Rapids, Mich.—p. 615.

Public Health as Important Part of Pan American Defense. D. F. Ramos, Havana, Cuba.—p. 627.

Teacher of Hygiene and Public Health. O. E. Byrd, Stanford University, Calif.—p. 631.

*Sensitivity to Coccidioidin Among Boys in Eastern Preparatory School. J. D. Aronson, Philadelphia, and J. R. Gallagher, Andover, Mass.—p. 636.

Isolation of Meningococcus from Genitourinary Tract of Seven Patients. C. M. Carpenter and Ruth Charles, Baltimore.—p. 640.

Active Immunization for Pertussis and Diphtheria.—Kendrick reports results of active immunization of 4,212 children against pertussis with vaccine. The value of alum precipitated vaccine has been compared with the "standard" pertussis vaccine and with combined pertussis vaccine and diphtheria toxoid. The results indicate a good degree of protection against pertussis following a dosage schedule of 30 billion organisms distributed in three injections over five weeks. They appear similar to those in which 70 billion organisms were injected over three weeks. The observations suggest that the period over which the vaccine is administered should receive as much consideration as the total dosage. Good antigenic response, demonstrated by immunologic tests, followed the use of alum precipitated vaccine and pertussis vaccine combined with diphtheria toxoid. An interim tabulation on incidence indicates protection against pertussis following the injection of the combined antigen. The tabulation reveals an attack rate of 0.7 per hundred person-years in the combined vaccine group in comparison with 1.6 in the standard vaccine group and 10.9 in a control group. A single, relatively small injection may provide an adequate secondary stimulus just before the child enters school.

Sensitivity to Coccidioidin.—Recent studies indicate that coccidioidomycosis may be more widespread than is generally believed. Aronson and Gallagher made a survey of 680 students at an eastern preparatory school. The students, aged from 13 to 19 years, were simultaneously tested with 0.01 mg. of old tuberculin of known potency and with 0.1 cc. of a 1:100 dilution of coccidioidin. Individuals negative to 0.01 mg. were subsequently tested with 1 mg. of old tuberculin. There were among these students 10 from Texas, 9 from California, 1 from

Arizona and 1 from New Mexico. Twenty-six per cent were positive to 0.01 mg. of old tuberculin, and an additional 2.7 per cent were positive to 1 mg., while 17, or 2.5 per cent, reacted to 0.1 cc. of a 1:100 dilution of coccidioidin. The coccidioidin test was repeated on the 17 students three months later with the same preparation of coccidioidin; the reactions of 13 were similar and those of 4 were less definite. A questionnaire sent to the parents of these 17 boys revealed that 9 had lived in or visited one or more of the Southwestern states. Only 8, or 1.2 per cent, of the 659 boys with no history of residence in the Southwestern states reacted to coccidioidin. Of the 17 boys who reacted to coccidioidin, 12 failed to react to the intracutaneous injection of 0.01 and 1 mg. of old tuberculin. Five of these 12 gave no definite medical history of coccidioidomycosis, although on roentgen study they showed definite calcified nodules well out in the pulmonary fields and in the hilar area; 4 of this group had at no time visited or lived in the Southwest. Of the 17, 2 gave a history of an illness suggestive of coccidioidomycosis. The protean manifestations and the variable severity of infection with Coccidioides immitis made it difficult to determine whether or not any of the 17 boys have had clinical evidence of coccidioidomycosis. All of them at one time or another have had an illness resembling influenza or grip, which in some instances may well have been due to Coccidioides immitis.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

47:665-824 (May) 1942

Critical Analysis of Standard Methods of Estimating Heart Size from Roentgen Measurements. W. J. Comeau, Bangor, Maine, and P. D. White, Boston.—p. 665.
Radiographic Demonstration of Circulation Through Heart in Adult and in Fetus, and Identification of Ductus Arteriosus. A. E. Barclay, J. Barcroft, D. H. Barron and K. J. Franklin, Oxford, England.—p. 678.
Experiences with Encephalography in Cerebellar Tumor. W. J. Gardner and W. A. Nosik, Cleveland.—p. 691.
Electroencephalogram and Pneumoencephalogram in Nonfocal Neurologic Disorders. E. H. Trowbridge Jr. and K. H. Finley, Boston.—p. 699.
*Tumors of Acoustic Nerve from Roentgenologic Point of View. C. W. Schwartz, New York.—p. 703.
Primary Tumors of Diaphragm Roentgenologically Considered. A. J. Ackermann, Oklahoma City.—p. 711.
Roentgen Pelvimetry in Labor by Pelvic Inlet Grid Method. R. Torpin, Augusta, Ga.—p. 717.
Syphilitic Ulcer on Greater Curvature of Stomach: Report of Case. D. B. Abegg, Leiden, Holland.—p. 730.
Some Physiologic Changes in Skin Produced by Neutrons. J. C. Larkin, Berkeley, Calif.—p. 733.
*Fibrosis of Lung Following Roentgen Irradiation for Cancer of Breast: Clinical Study. J. E. Leach, J. H. Farrow, F. W. Foote Jr. and N. W. Wawro, New York.—p. 740.
*Inadequacy of Simple Mastectomy in Operable Cancer of Breast. J. W. Bransfield and S. G. Castigliano, Philadelphia.—p. 748.
Roentgen Therapy in Otitis Media. L. L. Titche, Biloxi, Miss., and W. E. Lawson, Monroe, La.—p. 764.
Roentgen Therapy of Diphtheria Carriers. A. J. Williams and T. M. Fullenlove, San Francisco.—p. 766.
Tuberculosis of Breast Treated with Roentgen Irradiation. S. Richman, New York.—p. 771.
Direct or Indirect Action of Roentgen Rays on Brain. F. Ellinger, New York.—p. 775.
Exposure Meter for Roentgenography. R. H. Morgan, Chicago.—p. 777.
Low Absorption Roentgen Ray Measurements from 10 to 250 Kilovolts. E. D. Trout and Z. J. Atlee, Chicago.—p. 785.

Tumors of Acoustic Nerve.—Tumors of the acoustic nerve account for 8 to 9 per cent of all intracranial neoplasms. As a rule they develop in patients during their third decade, although no age is immune. They are rarely found in persons more than 50 and, if found in a young person, are usually associated with neurofibromatosis. If bilateral they are associated with central or generalized neurofibromatosis and often show a familial tendency. Schwartz discusses roentgen examination of a patient suspected of having a tumor of the acoustic nerve. The examination must be complete and must be carefully correlated with the history and clinical signs. The examination consists of stereoscopic films of both sides of the head in the occipital, the semilateral, the nose-chin and the brow-nose positions. The tumor usually originates in the canal close to the internal auditory meatus. The walls of the canal may show slight atrophy, which would be the earliest roentgen evidence. This atrophy must be real. The cortex must show demineralization to be atrophic. The next phase in the development of the tumor is the enlargement of the internal auditory meatus with atrophy of its walls, followed by emergence of the tumor from the canal and the production of a notchlike defect in the petrous ridge. Later, an encephalogram may show distortion, obliteration or even a cystic enlargement of the homolateral portion of the cisterna ambiens and of the aqueduct. Sufficient pressure may be transmitted to produce a slight homolateral atrophy of the dorsum sellae, particularly if this structure is of the type susceptible to atrophy. The last stage, when the tumor is large, is characterized by all the foregoing changes and evidence of increased intracranial pressure. The cortex of the interconvolutional ridges and the bone covering the ridges must be really atrophic to be due to pressure. The pineal gland may be displaced by the tumor. Unfortunately the development of all such tumors is not true to form. Not infrequently a tumor is found which produces little or no bony change until the stage of increased intracranial pressure is reached. In such a case a relatively early diagnosis would depend on the symptoms, clinical signs and encephalography, showing the usual distortions of the cerebral fluid spaces produced by a tumor in the cerebellopontine angle. A tumor of the acoustic nerve must be differentiated from a primary epidermoidoma of the petrous pyramid, a meningioma and a glioma of the astrocytic or the oligodendral type. The treatment of these tumors is a complete surgical removal. If a complete removal is impossible or inadvisable, roentgen therapy in large doses may be employed in the hope of inhibiting the almost inevitable growth of any remaining tumor tissue. The tumors contain few mitotic figures and are therefore not radiosensitive.

Pulmonary Fibrosis After Roentgen Irradiation of Mammary Cancer.—Leach and his collaborators reviewed the course of 347 patients with operable cancer treated partly or entirely with radiation between 1926 and 1936 inclusive and who are still alive. Roentgenographic evidence of pulmonary fibrosis developed in 77. Ninety-seven patients received preoperative irradiation, and of these 11 were treated with single doses of 500 to 850 roentgens and pulmonary fibrosis developed in only 1; 57 were treated with divided total doses of from 1,200 to 2,400 roentgens and 31 suffered from pulmonary fibrosis; of 31 treated with 4 Gm. radium element pack pulmonary changes developed in only 2. Pulmonary fibrosis developed in 7 of 77 patients irradiated postoperatively with massive doses to five fields, usually two cycles of 750 roentgens each, separated by an interval of about three months, but this complication developed in 8 of 41 in whom divided doses were used. When both preoperative and postoperative roentgen therapy was given to 37 in massive doses, fibrosis of the lung developed in 8. Pulmonary fibrosis developed in 12 of 67 receiving roentgen therapy (usually massive doses), interstitial radium and surgery; 8 of the 12 were associated with divided doses of radiation. Fibrosis developed in 7 of the 16 patients treated with radiation alone. The frequency of pulmonary fibrosis appears to be directly related to the large total doses delivered to the lung by divided dose technic and the area irradiated. Age does not appear to be a predisposing factor. The dyspnea in these patients, based on the studies of the alterations of pulmonary physiology, is due to a definite diminution of the vital capacity caused by the fibrosis, fixity of the wall of the chest, compensatory pulmonary emphysema and hyperirritable Hering-Breuer reflexes. The dyspnea may be relieved by an abdominal belt, weight reduction or both. The patient's cough improves as the dyspnea decreases.

Operable Cancer of Breast.—Bransfield and Castigliano point out that a simple mastectomy is performed in the belief that one is dealing with a local cancer. If this was so the cure rate should be 100 per cent; yet the five year survival rate is only 38 to 50 per cent. The deduction is that the error in such a clinical diagnosis is more than 50 per cent. Therefore, more than 50 per cent of mammary cancers thought to be early and supposedly curable by simple mastectomy have spread beyond the conservative operative field. From 30 to 40 per cent of cancers which have spread beyond the reach of the conservative operation have not progressed beyond the reach of the radical operation. Only about 10 to 25 per cent of cancers when first seen have spread beyond the operative extent of a radical mastectomy. The curability of cancer of the breast is not governed alone by its local character. The authors advocate the radical operation in all stage 1 and stage 2 cancers of the breast.

American Journal of Surgery, New York

56:523-704 (June) 1942

*Syndrome of Rolandic Vein (Hemiplegia of Venous Origin). H. R. Merwarth, Brooklyn.—p. 526.

Management of Malignant Tumors in Groin: Report of 122 Groin Dissections. G. T. Pack and P. Rekers, New York.—p. 545.

*Surgical Treatment of Peripheral Embolism. G. H. Pratt, New York.—p. 566.

Effect of Pectin and Nickel Pectinate on Healing of Granulating Wounds in Albino Rats. P. L. Norton, Brookline, Mass.; Louise Palmer Wilson, Ruth Johnstin and Delaphine G. Rosa, Wellesley, Mass.—p. 573.

*Peritoneal Adhesions: Studies on Their Prevention with Sodium Ricinoleate. S. F. Seeley, Washington, D. C.—p. 579.

Abdominal Aneurysm: Report of Twenty-Four Cases. E. L. Eliason and H. G. McNamee, Philadelphia.—p. 590.

Pemphigus Vulgaris of Urinary Bladder. J. A. Hyams and I. Botvinick, New York.—p. 594.

Diagnosis of Torsion of Pedicle of Ovarian Cyst. H. G. Hardt Jr. and L. Seed, Chicago.—p. 598.

Dislocation of Toes. F. G. Schnek, Chicago.—p. 603.

Ununited Fractures of Carpal Scaphoid. A. S. Rothberg, New York.—p. 611.

Meckel's Diverticulum: Report of Twelve Cases. H. Wilson, Memphis, Tenn.—p. 614.

Fiberglass Suture Material: Preliminary Report. R. P. Scholz and P. S. Mountjoy, St. Louis.—p. 619.

Value of Cystoscopic Photography in Medicine. L. E. McCrea, Philadelphia.—p. 622.

Colloidal Metallic Silver Tampon for Treatment of Rhinitis, Sinusitis, etc. A. J. Herzig, New York.—p. 626.

Methyl Cellulose Solution as Plasma Substitute. W. C. Hueper, G. J. Martin and M. R. Thompson, New York.—p. 629.

Treatment of Female Menopause with Methyl Testosterone and Stilbestrol. L. Kurzrok and H. Rothbart, Brooklyn.—p. 636.

Technic of Inserting the Steinman Pin. D. Sloane, New York.—p. 640.

Rolandic Vein Syndrome.—Merwarth states that the disturbances of the syndrome of the rolandic vein, resulting from interference with the cerebral venous circulation, have not received concerted clinical attention because of their relative infrequency. The tendency has been to regard the cerebral veins as structures devoid of physiologic importance. The physical symptoms resulting from interruption of the drainage of the rolandic vein form the ideal basic situation for suspecting such interference, especially when previous infection, tumor or trauma has existed in or near the superior sagittal sinus. The principal feature of a venous hemiplegia is symptomatic fluctuation which embraces both the motor and sensory fields. The responses of the patient in the higher fields of intellect are relatively unimpaired. Aphasic and dysarthric speech, usually found in arterial disorders, is absent. Facial paralysis is uncommon. The paralysis is characteristic: the lower limb, particularly the foot, is paralyzed to the greatest degree. In the upper limb the proximal joints are weakened while the finger and hand movements are usually preserved but, if involved, soon recover. This is in distinct contrast to capsular hemiplegia. Early in the disease the muscle tone on the paralyzed side, which fluctuates widely, is unusually spastic. At one examination the limb may be hypertonic, at another hypotonic. This phase of the illness may be missed completely if frequent examinations are not made. There is no tendency to articular fixation in venous hemiplegia. The deep reflexes are hyperactive early, although if examined during the state of "nonrigidity" they may be diminished. Recovery of motor function, following the motor representation in the rolandic area, is the second prominent feature of venous hemiplegia. The preserved function in the fingers and hand with absence of movement at the elbow, shoulder and lower limb is striking. In time function returns progressively to the elbow, shoulder and lower limb. The last function to recover, if at all, is that of the foot and the toes. The sensory loss is chiefly in the gnostic field, the delayed recovery of which does not parallel the motor recovery. There is a tendency to variation; the observations of two successive examiners may be contradictory. The general prognosis is complete recovery. Thirty-one cases were collected by the author from the literature and from personal communications. When the sinus anterior to the rolandic point was removed in 17 there were 6 in which no postoperative disability was noted. In 3 among the 12 in which portions of the sinus at or posterior to the rolandic point were removed no new postoperative symptoms occurred. The resected sinus showed complete occlusion, suggesting utilization of the available profuse collateral circulation. Although the literature stresses the major emergent channel, careful analysis shows that it is the tributary cerebral veins which are of basic importance. A study of the reported successes after a portion of the sagittal sinus was removed behind its vulnerable site—the rolandic point—indicates that a previous circulatory adaptation was set up by the profuse venous anastomosis that exists between the terminal cerebral veins and their many interlocking tributaries.

Surgical Treatment of Peripheral Embolism.—Pratt believes that peripheral embolism should be treated with embolectomy as soon as the diagnosis is made, despite the fact that occasionally neglected patients survive. Many such recoveries are not truly embolic. In the presence of bilateral symptoms, both femoral arteries should be exposed at once. What can be accomplished in an apparently hopeless state is illustrated by a case in which removal of a large saddle embolus sixty hours after its lodgment resulted in a survival and complete restoration of circulation in one limb and in the other to the knee. The right side apparently closed off earlier than the left, perhaps with an additional tibial embolus. The mottling of the left side indicated a beginning arterial failure on the day of the embolism. Collaterals were probably helpful until the next day, when these likewise failed. The recovery in this case indicates that the arbitrary time limit can be successfully modified in most instances.

Peritoneal Adhesions.—The studies of Seeley on rats, rabbits and monkeys show that stimulation of the peritoneum by sodium ricinoleate imitates nature's processes of healing by producing an abundant exudate rich in neutrophilic polymorphonuclear leukocytes and monocytes from which abundant fibrin is deposited. The presence of this abundant exudate acts as a lubricant to prevent the formation of adhesions. In addition, sodium ricinoleate possesses bactericidal, bacteriostatic and detoxifying properties and by slowing or reversing absorption from the peritoneal cavity assists in combating infection. Sodium ricinoleate is well tolerated intraperitoneally in laboratory animals and in the human being. It is capable of preventing the majority of unfavorable adhesions after drastic trauma to the viscera and peritoneum of animals. Sodium ricinoleate solutions must be freshly prepared in pyrex glassware. Old stock solutions are toxic. Any agent designed to prevent or reduce the number of adhesions must be introduced very early.

Annals of Internal Medicine, Lancaster, Pa.

16:811-1052 (May) 1942

*Gold Salts in Treatment of Rheumatoid Arthritis: Study of 245 Cases. R. L. Cecil, W. H. Kammerer and F. J. DePrume, New York.—p. 811.

Manifestations in Skin and Mucous Membranes in Dermatomyositis, with Special Reference to Differential Diagnosis from Systemic Lupus Erythematosus. H. Keil, New York.—p. 828.

Multiple Tests of Hepatic Function in Gastroenteric Malignancy: Value of Bromsulphalein, Hippuric Acid and van den Bergh Reaction in Detecting Hepatic Metastasis, with Evaluation of Normality of Hippuric Acid Test. M. Paulson, Baltimore, and C. I. Wyler, Cincinnati.—p. 872.

Some Effects of Potassium Salts in Man. N. M. Keith, A. E. Osterberg and H. B. Burchell, Rochester, Minn.—p. 879.

Treatment of Diabetes Mellitus with Protamine Insulin: Is a Persistent Glycosuria Harmful? Metabolic Study of Severe Case. E. Tolstoi, T. P. Almy and V. Toscani, New York.—p. 893.

Subacute Bacterial Endocarditis: Analysis of Fifty Cases with Autopsy Findings. H. C. Denman, Brooklyn.—p. 904.

*Periarteritis Nodosa: Case Reports. G. M. Jones Jr., Dallas, Texas.—p. 920.

*Anticipation and Diagnosis of Neurocirculatory Asthenia. J. T. King, Baltimore.—p. 941.

Clinical Manifestations and Diagnosis of Chronic Brucellosis. R. C. Manchester, Alliance, Ohio.—p. 950.

*Familial Syringomyelia and Status Dysraphicus. B. E. Mulvey and Lea A. Riely, Oklahoma City.—p. 966.

Eosinophilia and Pneumonitis in Chronic Brucellosis: Report of Two Cases. K. A. Elsom and F. J. Ingelfinger, Philadelphia.—p. 995.

Whither? J. A. Miller, New York.—p. 1003.

Gold Salts in Treatment of Rheumatoid Arthritis.—Cecil and his co-workers discuss the results of gold salt therapy in 245 cases of rheumatoid arthritis. There were 31 per cent in which complete remission of pain and swelling in the joints occurred and 35 per cent in which there was definite improvement; in all 66 per cent either became inactive or were greatly improved. Early treatment led to even better results; 78 per cent treated early (duration of disease less than one year)

showed either a complete remission or a decided improvement. The percentage of remissions and decided improvement was about the same in the mild and in the severe cases; 67 and 63 per cent, respectively. Seventy-seven per cent of such patients received a total of 1 Gm. or more of gold salt, whereas only 41 per cent of those who showed no improvement received such a dose. Three of the 10 patients with ankylosing spondylitis received inadequate treatment. Of the remaining 7, only 1 was improved. Two children with Still's disease were treated with not more than 0.5 Gm. of gold salts; 1 has had a complete remission for more than five years and the other child, still under treatment, has shown moderate improvement. The sedimentation rate in 47 per cent of those with remissions was normal or only moderately elevated after gold therapy, in contrast to only 5 per cent of those who showed no improvement. Age, sex and severity of the disease do not appear to be determining factors. Relapses occurred in 42 per cent of the patients who received definite benefit from gold therapy. The relapses were usually milder than the original attack but yielded less promptly to gold therapy. Remissions lasted more than a year in 52 per cent. The incidence of toxic reactions (exfoliative dermatitis, other cutaneous lesions, stomatitis, gastrointestinal symptoms, jaundice, purpura, granulocytopenia, bronchitis and albuminuria) was 42 per cent. No effective means of preventing or treating toxic reactions has been found.

Periarteritis Nodosa.—To date 14 proved cases of periarteritis nodosa have been observed at the University Hospital among more than 460,000 admissions. In 7 a correct antemortem diagnosis was made. The diagnosis, according to Jones, can be demonstrated only by a positive biopsy, although a negative biopsy does not rule out the condition. The symptoms are varied, as arteries in any part of the body may be involved. The most common symptoms are referable to the organs most commonly affected. The duration of the illness was closely correlated with the degree of involvement of the vital organs and their resultant dysfunction. The average length of life after the onset of illness was eleven and one-tenth months. The etiology of periarteritis nodosa is unknown, but the close relationship between the disease and previous and concomitant infection is evident. Only 2 of the 14 patients are still alive. Since there is no known treatment and there is so often an associated infection, the trial of sulfanilamide or sulfapyridine seems justifiable until an adequate number of cases have been accumulated from which conclusions may be drawn.

Neurocirculatory Asthenia.—King emphasizes that, to prevent the acceptance of men with potential neurocirculatory asthenia into the armed forces, the internist and the psychiatrist must work together. The psychiatrist should be expected to recognize potential cases on the basis of intelligence defects, unstable reaction to authority (parental, clerical or other), chronic invalidism, especially referred to the cardiovascular system and emotional instability, sense of inferiority resulting from sex maladjustment, fear of warfare, fear of shirking and the like. The internist should eliminate men with symptoms based on the previous background of recent infections, general physical (constitutional) inferiority, men with demonstrably small hearts, asthenic habitus (with "ventral" heart) and neurocirculatory sensitiveness (history of abnormal reaction to coffee, tobacco and alcohol may afford a clue). Some exercise test is essential, and that suggested by Meakins and Gunson (the pulse rate after a simple exercise test) seems good. In doubtful cases it may be desirable to apply the epinephrine test. A positive response to the injection of 0.5 cc. of a 1:1,000 solution of epinephrine consists in a rise of blood pressure of 10 mm. or more, a rise in pulse rate of ten or more beats per minute, with tremor, nervousness, palpitation of the heart and sweating. Men with positive reactions are unfit for duty and should be rejected. A negative response does not eliminate the diagnosis. The test merely furnishes additional evidence that the subject is poor material for military service.

Familial Syringomyelia and Status Dysraphicus.—Mulvey and Riely studied several members of three generations of a family various individuals of which presented signs and symptoms of impaired circulation to the extremities, disturbance of sensation in the lower limbs and feet and, in a few members, similar disturbances in the hands. Slow healing ulcers were present in the feet of some. Structural anomalies and the so-called stigmas of degeneration were present in nearly all. The person representing the first generation of this family was not examined, but evidence given by members of the second generation reveals that this man had severe disease of the feet throughout the greater part of his eighty-one years of life. Of 14 members of the second generation only 5 are living, and of 4 examined 2 are apparently free of the affliction. Of the dead members there is strong evidence that 1 died with gangrene of the feet. In the third generation 7 of a possible 15 individuals have been examined. Six of these 7 members show some degree of dissociation of sensibility in the feet. Some have exhibited changes as high up as the knees. Two have had impairment of sensation in the hands. Loss or decrease of pain and temperature sensibility is the most important neurologic change in these patients, 4 members show some disturbances in the sense of position. All patients in both generations, except 2 women in the second generation, appear to have been poured from a common mold. All were tall and thin. The hands and feet were narrow and long, the fingers, except in 1, were long and slender. All had high arched palates, 2 had a moderate pes cavus and 2 had painless flat feet. The scapulas of all had a definite tendency toward winging. Four of the third generation gave histories suggestive of Raynaud's phenomenon, although attempts to precipitate the symptoms in 1 were not successful. Of the 6 individuals who have had painless slow healing ulcers of the feet, 3 gave a history of bone sloughing from these ulcers, 2 a history of self amputation of some of the toes and 1 had had an amputation at the knee joint because of deformities and osteomyelitis. On roentgen study trophic changes were seen in the bones of the feet of 2 patients, and loss of bone structure in the phalanges. In 1 patient a roentgenogram of the lumbar spine disclosed a spina bifida occulta. In 3 patients the onset of menses was late, at 17, 19 and 20 years, respectively. In view of the lack of progression, as in a genuinely active syringomyelia and the relatively static nature of the defect that marks this family, it is concluded that the disturbances are due to the presence of a definite constitutional status dysraphicus. Status dysraphicus, or faulty closure of the neural tube, early in embryonic life is readily transmitted to offspring as a dominant characteristic.

Annals of Surgery, Philadelphia

115:881-1210 (June) 1942. **Partial Index**

Defense of Human Body Against Living Mammalian Cells. H. B. Stone, Baltimore.—p. 883.
Transthoracic Resection of Tumors of Stomach and Esophagus. E. D. Churchill and R. H. Sweet, Boston.—p. 897.
Problem of Intestinal Gases Complicating Abdominal Surgery. A. O. Singleton, F. Rogers and F. G. Houston, Galveston, Texas.—p. 921.
Vitamin Deficiency as Factor in Etiology of Surgical Diseases of Digestive System. F. K. Boland, Atlanta, Ga.—p. 939.
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Surgical Treatment of Malignant Lesions of Sigmoid—with Extension. R. F. Bowers, New York.—p. 986.
Abdominal Surgery: Mechanism of Action of Roentgenotherapy on Infection. J. D. Bisgard, H. B. Hunt, O. A. Neely and P. Scott, Omaha.—p. 996.
Tests of Hepatic and Pancreatic Function in Differential Diagnosis and Preparation of Patients with Lesions of Biliary Tract. W. D. Andrus, J. W. Lord Jr. and M. Lake, New York.—p. 1015.
*Vitallium Tubes in Biliary Surgery. H. E. Pearse, Rochester, N. Y. —p. 1031.
*Spontaneous Internal Biliary Fistula. C. B. Puestow, Chicago.—p. 1043.
*Reflexes Originating in Common Duct Giving Rise to Pain Simulating Angina Pectoris. I. S. Ravdin, H. P. Royster and G. B. Sanders, Philadelphia.—p. 1055.
*Clinical and Experimental Studies with Koch Method of Treatment of Heat Burns. V. E. Siler and M. R. Reid, Cincinnati.—p. 1106.
Infected Burns with Hemorrhage. W. A. Altemeier and B. N. Carter, Cincinnati.—p. 1118.
Simple Method for Estimating Plasma Protein Deficit After Severe Burns. W. A. Wolff and W. E. Lee, Philadelphia.—p. 1125.
Procurement and Use of Blood Substitutes in the Army. D. B. Kendrick Jr., Washington, D. C.—p. 1152.
Intravenous Injections of Amino Acids (Hydrolyzed Casein) in Postoperative Patients. R. Elman, D. O. Weiner and E. Bradley, St. Louis.—p. 1160.

Vitallium Tubes in Biliary Surgery.—Pearse cites data from animal experimentation, dissection on cadavers and clinical experience with the use of vitallium tubes in biliary surgery. Injury to the bile ducts, irreparable by other methods, has been

treated successfully by the permanent implantation of a vitallium tube. A straight 3.3 cm. by 6 mm. tube with a central flange to anchor it in place is most useful to hold open a strictured area of the common bile duct. Loss of a part of the common duct is best repaired by approximating the ends over a vitallium tube even if tension must be used. This holds the ends of the duct together, and the tube prevents occlusion by stricture. To bridge a gap by tying the tube into the ends of the duct may be dangerous, for it may slip out of place. Injury or stricture of the common hepatic duct within 1 cm. of the bifurcation of the hepatic ducts produces mechanical problems that require specially designed tubes; for this purpose trumpet Y and half Y shaped tubes have been made. Vitallium tubes have been used in the repair of a pancreatic fistula, and one has been designed for the palliative intubation of a malignant occlusion of the bile ducts.

Spontaneous Internal Biliary Fistula.—In a series of five hundred operations for benign disease of the biliary tract Puestow encountered 16 patients with spontaneous biliary fistulas. The duration of symptoms varied from one month to twenty-seven years. A preoperative roentgen diagnosis was made in 2. Seven of the 9 patients with a cholecystoduodenal fistula gave a history of jaundice, 1 of the 2 without jaundice had an obliterated cystic duct and the other 1 had been operated on eighteen years previously and was of the opinion that her gallbladder had been removed. At operation the gallbladder was found to be present and filled with stones. There were 3 deaths among the 16 patients. This is extremely high when compared to the author's mortality of 1.2 per cent for uncomplicated cholecystectomy. The morbidity of biliary surgery complicated by internal fistula likewise is increased. The average length of hospital stay after operation was twenty-three and five-tenths days compared to twelve and seven-tenths days for all other operations for benign disease of the biliary tract. The time required for the disappearance of jaundice, the return of weight and strength and the ability to return to normal activities was several times that following surgery for uncomplicated biliary disease.

Bile Duct Reflexes and Anginal Pain.—Ravdin and his associates observed patients with decompensated hearts and chronic auricular fibrillation restored to compensation and a regular cardiac rhythm with no change in the medical regimen following removal of gallstones by cholecystostomy. Long-standing serious heart disease has made patients hopeless invalids by the additional symptoms imposed by a gallbladder containing gallstones or by the presence of stones in the common duct. The authors have encountered a number of patients who were treated for true angina pectoris by competent cardiologists but who were completely free of their supposed anginal attacks after the removal of gallstones, common duct stones or both. Layne and Bergh reported that sudden distention of the common duct in man may cause reflex spasm at the lower end of the common bile duct. Reflexes arising in the extrahepatic biliary passages may at times restrict coronary blood flow and produce symptoms of angina pectoris. The histories of 2 such patients are reported probably for the first time. When the extrinsic factors causing these reflexes are removed, the anginal symptoms disappear. While surgery does not completely relieve the cardiac symptoms, some measure of relief is nearly always obtained.

Koch Method of Treating Burns.—During the last two years, Siler and Reid have used the Koch method of primary cleansing, compression and rest in the treatment of burns of 134 patients: 90 children and 44 adults. As measured by Berkow's method, less than 15 per cent of the body surface was involved in 39 cases, 15 to 30 per cent in 58, 30 to 60 per cent in 27, 60 to 85 per cent in 9 and 85 or more per cent in 1. There were five deaths, a mortality of 3.7 per cent. Clinically, 79 had no infection, 15 were mildly infected, 25 were grossly infected and in 15 it is not known whether or not infection was present. There were only a few minor infections in patients with first and second degree burns. No deaths were due to infection, unless the port of entry of the 1 patient with the 85 per cent burn who died fourteen days after operation from streptococcic pneumonia, empyema and suppurative pericarditis was from the burned area. Suffering was strikingly decreased by this method of treatment. It rarely was necessary to use morphine or codeine for more than a day or two after operation. The patients could move about much more easily. There was a great saving in dressing materials when compared with other methods which require frequent changes of dressings or compress therapy. Temperatures returned to normal levels rapidly. These patients rapidly regained their water balance by oral fluid; parenteral administration was required only in the more severe cases. Solid food was enjoyed early in convalescence. It is the authors' belief that the careful preparation of the wound, under anesthesia, and the long duration of the primary dressing definitely lessened the incidence of infection. The pressure dressing may aid materially in preventing the loss of plasma at the site of the wound and into the surrounding tissues.

Archives of Ophthalmology, Chicago

27:1047-1266 (June) 1942

Paths of Progress of Ophthalmology. H. Friedenwald, Baltimore.—p. 1047.
*Dinitrophenol and Its Relation to Formation of Cataract. W. D. Horner, San Francisco.—p. 1097.
Model of the Visual Pathways. S. D. Liebman, Boston.—p. 1122.
Sodium, Chloride and Phosphorus Movement and the Eye: Determined by Radioactive Isotopes. V. E. Kinsey, W. M. Grant, D. G. Cogan, J. J. Livingood and B. R. Curtis, Boston.—p. 1126.
Carcinoma of Limbus. S. D. Evans, Pittsburgh.—p. 1132.
Treatment of Experimental Bacillus Pyocyaneus Ulcer of Cornea with Sulfapyridine. H. H. Joy, Syracuse, N. Y.—p. 1135.
*Eye Worm (Thelazia Californiensis) Infection in Man. G. N. Hosford, M. A. Stewart and E. I. Sugarman, San Francisco.—p. 1165.
*Oxycephaly: Twenty-Five Year Report of Case from Ophthalmologic Point of View. H. Levine, Fall River, Mass.—p. 1171.
Diagnostic Aids in Study of Glaucoma. J. N. Evans, Brooklyn.—p. 1177.
Influence of Constricted Pupil on Field in Glaucoma. S. Engel, San Francisco.—p. 1184.
Idiopathic Multiple Hemorrhagic Sarcoma (Kaposi): Report of Unusual Case in Which Initial Lesion Was on Eyelid. T. N. Graham, New York.—p. 1188.
Interstitial and Ulcerous Keratitis in Leishmaniasis. C. de Andrade, Bahia, Brazil.—p. 1193.

Dinitrophenol and Formation of Cataract.—A sporadic outbreak of more than 164 cataracts, predominantly in young women, which began about April 1935, rapidly increased during the summer and fall and gradually disappeared during 1936-1937 like an epidemic, seemed to point, Horner states, to dinitrophenol as a common source, taken for the rapid reduction of body weight. The cataracts were bilateral and were all of one type, they developed rapidly, were accompanied by visual loss and occurred at any time up to a year after the drug was discontinued. Medical treatment was without effect, but surgical extraction was successful and excellent visual acuity was obtained in a large percentage of cases. Attempts to produce cataracts in laboratory animals have been unsuccessful. The cause of cataracts following treatment of obesity with dinitro bodies is unknown. Further therapeutic use of dinitro drugs is contraindicated, and some other less toxic substitute as an efficient oxidizer of excess body fat may be developed through the knowledge that has accumulated in the study of dinitrophenol.

Eye Worm Infection in Man.—Hosford and his co-workers report the second case of infection in man with a nematode worm, Thelazia californiensis. Helminthologists believe that such infection may occur in man more frequently than is indicated by the recorded cases. Infection with this parasite is presumably rather benign, but trauma of some magnitude may occur. The history of their patient substantiates the opinion that infection is acquired in hilly or mountainous country covered with brush during the summer months. Cocainization of the eye should be avoided when the parasites are removed, as it may tend to be absorbed by the parasites and render them less motile and hence less easily seen. The only damage the worms do in man or in animals is to cause discomfort, excessive lacrimation and in some cases scarification of the cornea with subsequent ulceration. The worms should be searched for on repeated occasions, as it is difficult to be certain that all of them have been removed at a single examination.

Oxycephaly.—The ocular effect twenty-five years after three cerebral decompressions in a case of oxycephaly suggests to Levine that solely from an ocular point of view it is doubtful whether temporal decompression has any beneficial effect on the ocular system in oxycephaly.

Archives of Surgery, Chicago

44:963-1182 (June) 1942

*Cyst of Common Duct. B. C. Smith, New York.—p. 963.
Absorption of Surgical Gut (Catgut): II. Pepsin Digestion Tests for Evaluation of Duration of Tensile Strength in Tissues. H. P. Jenkins and L. S. Hrdina, Chicago.—p. 984.
Solitary Unicameral Bone Cyst, with Emphasis on Roentgen Picture, Pathologic Appearance and Pathogenesis. H. L. Jaffe and L. Lichtenstein, New York.—p. 1004.
Recurrent Dislocation of Patella: Study of End Results in Twenty-Seven Cases. S. S. Houkom, Duluth, Minn.—p. 1026.
Tumors of Tendon Sheaths. H. Charache, Brooklyn.—p. 1038.
End Results of New Incision for Felon (Infection of Anterior Space). J. J. Weiner, New York.—p. 1053.
Regeneration of Serum Albumin with Hydrolyzed Protein in Chronic Hypoproteinemia Produced by Diet: Experimental Study. R. Elman, L. A. Sachar, A. Horwitz and Harriet Wolff, St. Louis.—p. 1064.
*Hypoproteinemia in Surgical Diseases: Relation of Serum Protein Level to Hepatic Function and Influence of Transfusion of Ascitic Fluid. H. A. Davis and P. L. Getzoff, New Orleans.—p. 1071.
Changes in Blood and Composition of Peritoneal Exudate in Induced Spreading Peritonitis: Preliminary Report. J. O. Bower, L. A. Terzian and A. E. Pearce, Philadelphia.—p. 1091.
Esophageal Diverticula. J. D. Bisgard, Omaha.—p. 1103.
Influence of Vitamin B Complex Deficiency and Partial Starvation on Wound Healing: Experimental Research with Rats. Janet C. Holden and G. Crile Jr., Cleveland.—p. 1106.
Stimulation of Celiac Plexus in Dog: II. Factors Influencing Cardiovascular and Respiratory Responses. S. J. Martin, C. L. Burstein and E. A. Rovenstine, New York.—p. 1111.
*Hemostatic Effect of Oxalic Acid: Clinical and Experimental Results, with Review of Literature. A. W. Blain and K. N. Campbell, Detroit.—p. 1117.
Review of Urologic Surgery. A. J. Scholl, Los Angeles; F. Hinman, San Francisco; A. von Lichtenberg, Mexico, D. F., Mexico; A. B. Hepler, Seattle; R. Gutierrez, New York; G. J. Thompson, J. T. Priestley, Rochester, Minn.; E. Wildbolz, Berne, Switzerland, and V. J. O'Conor, Chicago.—p. 1126.

Common Duct Cyst.—Smith collected 181 cases of cyst or idiopathic cystic dilatation of the common duct from the literature. He reports 2 additional cases from the Presbyterian Hospital found among the records of 757,000 cases. Most of the patients were females under the age of 25. A number were pregnant when the cyst became obvious. The cyst wall frequently consisted of fibrous tissue without a lining epithelium. The condition may be suspected in the presence of a growing tumor of the right upper quadrant of the abdomen in a young female patient with jaundice. It had occurred in young males and in middle aged persons of both sexes and without jaundice. Immediate anastomosis with the gastrointestinal tract may be indicated if the cyst is not too large, its identification being positive and the patient's condition permitting such an intervention. The ill effects of the absence of bile from the gastrointestinal tract when complete biliary fistula is established by marsupialization can now be partly relieved by the administration of vitamin K and bile salts or desiccated animal bile. The author's first patient is the first recorded instance in which such treatment was carried out. Each of these cases provides an opportunity for the study of human fat absorption in the absence of bile from the gastrointestinal tract. The literature lacks follow-up reports on the late results of anastomosis of these cysts.

Hypoproteinemia in Surgical Disease.—Davis and Getzoff classify hypoproteinemia in surgical diseases as prehepatic, hepatic and posthepatic. In the prehepatic type the causative factors are those of inadequate intake, deficient digestion or insufficient absorption of plasma protein building material. Hepatic hypoproteinemia results from the inability of the liver to synthesize plasma proteins despite an adequate supply of precursor material. Extrahepatic infections may result in hypoproteinemia. Another important factor is loss of protein into the site of suppuration. The posthepatic type of hypoproteinemia results from a loss of fully formed plasma protein from the body due to plasmapheresis, hemorrhage, subcutaneous or intraperitoneal injections of bile, burns, trauma and freezing. Protracted loss of blood is an occasional factor. The different forms of hypoproteinemia vary in their response to treatment. In addition to dietary treatment it is usually necessary to administer additional proteins or amino acids by the parenteral route. The available protein and amino acids are whole blood, blood plasma (whole or lyophilized), blood serum (whole or lyophilized), ascitic fluid and digests of casein. Ascitic fluid may be administered intravenously or subcutaneously, preliminary typing or cross matching being unnecessary. Papain digests of casein given intravenously or subcutaneously have been shown to stimulate new plasma protein production as effectively as protein given by mouth. Administration of amino acids will be effective only if the liver is capable of protein synthesis. Vitamin C should be administered with amino acid as it is essential for the proper metabolism of certain amino acids, phenylalanine and tyrosine.

Hemostatic Effect of Oxalic Acid.—In the administration of oxalic acid to 440 operative patients, on whom nearly all major operative procedures were performed, Blain and Campbell observed that: 1. Cessation of hemorrhage was immediate or there was a noticeable decrease in oozing. 2. A definite measurable reduction in coagulation time occurred. 3. There was no appreciable decrease in prothrombin time. 4. The best clinical results were obtained in cases with much surface oozing. 5. There was no clinically demonstrable renal damage. 6. Thrombophlebitis did not develop nor were there any other untoward reactions. 7. There was an apparent decrease in the amount of serum collecting at the incision. 8. Administration of oxalic acid effectively controlled bleeding associated with carcinoma. It is in the troublesome cases in which definite capillary oozing continues after all bleeding points have been ligated that the effect has been most dramatic. Postoperative sequelae have been favorably influenced, particularly wound infection. Wound infection may occur not only from micro-organisms but also from the collection of blood or serum. Excessive oozing cannot always be anticipated. Because 20 mg. of the drug is harmless the authors administer it routinely in certain types of major operation. Patients with jaundice and vitamin K deficiency have not been included in the series.

Bulletin Johns Hopkins Hospital, Baltimore

70:467-522 (June) 1942

Analysis of Mental Defect in Chronic Korsakov's Psychosis by Means of Conditioned Reflex Method. W. H. Gantt and W. Muncie, Baltimore.—p. 467.
Analysis of Deaths in Operating Rooms of Johns Hopkins Hospital, with Special Reference to Those Occurring Under General Anesthesia and Spinal Anesthesia. J. Lyford III, Olive L. Berger and H. B. Shumacker Jr., Baltimore.—p. 488.
Difficulties in Enzymic Titration of Duodenal Contents. W. C. Davison, Baltimore.—p. 504.

Canadian Public Health Journal, Toronto

33:185-240 (May) 1942

The Changing Place of the Laboratory in Public Health. C. E. Dolman, Toronto.—p. 185.
Half a Century of Diphtheria Prevalence in Quebec. A. R. Foley, Quebec.—p. 198.
Outbreak of Paratyphoid Fever in the City of North Battleford, Sask. R. O. Davison, Regina, Sask.—p. 205.
Lymphocytic Choriomeningitis. C. A. Mitchell and M. O. Klotz, Ottawa, Ont.—p. 208.
Some Aspects of Control and Prevention of Venereal Diseases. E. Lalande, Montreal.—p. 214.
Errors in Calculation of Nutritive Value of Food Intake: II. Comparison of Calculated and Determined Amounts of Ascorbic Acid. Constance M. Young and E. W. McHenry, Toronto.—p. 224.

Delaware State Medical Journal, Wilmington

14:77-136 (May) 1942

War and Postwar Psychoses. M. A. Tarumianz, Farnhurst.—p. 77.
Results of Lobotomies at Delaware State Hospital. P. F. Elfeld, Farnhurst.—p. 81.
Kleptomania. B. G. Lawrence, Farnhurst.—p. 83.
Observations Concerning Electroshock Therapy. F. Paul, Farnhurst.—p. 86.
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Frontal Lobes, Prefrontal Lobotomy and Psychoses. D. E. Wynegar, Farnhurst.—p. 96.
Neuropsychiatric Aspects of Carcinomatosis, with Reports of Two Cases. G. J. Gordon, Farnhurst.—p. 99.
Bronchogenic Carcinoma: Two Cases. M. Zimbler, Farnhurst.—p. 105.
Electric Convulsive Therapy in Mental Disorders. G. S. Bieringer, Farnhurst.—p. 112.
Psychosomatic Study of Three Cases of Bronchial Asthma. F. A. Freyhan, Farnhurst.—p. 115.

Georgia Medical Association Journal, Atlanta

31:183-224 (May) 1942

Medical Problems of 1942. A. H. Bunce, Atlanta.—p. 183.
Presentation of the President's Gold Key to Dr. Allen H. Bunce. W. A. Selman, Atlanta.—p. 186.
Present Day Treatment of Pneumonia. A. Dimmock, Atlanta.—p. 187.
Choice of Anesthetic. W. P. Nicolson Jr., Atlanta.—p. 192.
Congestive Heart Failure. W. Harbin Jr., Rome.—p. 197.

Indiana State Medical Assn. Journal, Indianapolis

35:241-294 (May) 1942

Ophthalmology: Past, Present and Future. N. S. McBride, Terre Haute.—p. 241.
Trachoma and Follicular Conjunctivitis. E. L. Van Buskirk, Lafayette. —p. 243.
Eyes and Military Services. M. S. Harding, Indianapolis.—p. 246.
Recent Advances in Eye Surgery: Paper for the General Practitioner. B. D. Ravdin, Evansville.—p. 249.
Inflammatory Swelling of Eyelids. M. C. Wells, Anderson.—p. 252.
Aids to the General Practitioner in the Conservation of Vision. C. L. Mahoney, Terre Haute.—p. 255.
Practical Points in Endocrine Diagnosis and Therapy. J. H. Hutton, Chicago.—p. 259.
Emotional Aspect in Pediatrics. B. K. Rust, Indianapolis.—p. 264.

35:295-344 (June) 1942

Intestinal Obstruction: Consideration of an Infrequent Type of Mechanical Obstruction of Small Intestine Resulting from Herniation of Bowel Through Aperture in Mesentery. J. S. Robison, Winchester.—p. 295.
Prophylaxis of Postoperative Thrombosis and Pulmonary Embolism. H. D. Cogswell, Whiting.—p. 304.
Modern Method of Managing Acute Appendicitis with Rupture and Generalized Peritonitis. W. C. Reed, G. E. Leone and B. Word, Camp Shelby, Miss.—p. 307.
Tobacco Intoxication. B. Kilgor Jr., Danville.—p. 313.

Iowa State Medical Society Journal, Des Moines

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Field Studies of Tuberculosis in Iowa. B. J. Olson, Washington, D. C., and C. K. McCarthy, Des Moines.—p. 248.
Fluid Therapy in Pediatrics. Charlotte Fisk, Des Moines.—p. 251.
Lobectomy for Bronchiectasis. P. F. Olson, Dubuque.—p. 255.
Vaginal Tampons for Menstrual Hygiene. A. W. Diddle and L. Boulware, Iowa City.—p. 256.
Potential Toxicity of Implanted Sulfanilamide. J. W. Chambers, Des Moines.—p. 257.
Poliomyelitis Following Tonsillectomy. W. Cary, Dubuque.—p. 259.

Journal of Nervous and Mental Disease, New York

95:537-668 (May) 1942

A Psychoanalyst Scans His Past. A. A. Brill, New York.—p. 537.
Neuromuscular Hypertension and Understanding of Nervous Conditions. T. Braatöy, Oslo, Norway.—p. 550.
Diagnostic Value of Special Characteristics of Convulsions in Brain Tumors. A. Gordon, Philadelphia.—p. 568.
*Neurologic Aspects of Simple Mastoiditis. E. H. Trowbridge Jr., Boston. —p. 575.
Factors Affecting Prognosis of Paranoid Disorders. C. W. Miller Jr., Philadelphia.—p. 580.
Psychotic Manifestations in Chronic Encephalitis. J. L. Nelson and J. Zimmerman, Brooklyn.—p. 589.
Treatment of "Metrazol Failures" with Insulin: Report of 100 Cases. J. Weinberg and H. H. Goldstein, Chicago.—p. 597.

95:669-796 (June) 1942

Group of Dementia Precox Patients with Increase of Protein Content of Cerebrospinal Fluid. W. L. Bruetsch, M. A. Bahr, J. S. Skobba and W. J. Dieter, Indianapolis.—p. 669.
Combination of Friedreich's Ataxia and Charcot-Marie-Tooth Atrophy in Each of Two Brothers. A. T. Ross, Indianapolis.—p. 680.
Absence of Deterioration in Patients with Nonorganic Epilepsy, with Special Reference to Bromide Therapy. G. K. Yacorzynski and A. J. Arieff, Chicago.—p. 687.
Electrotherapy in Schizophrenia. J. L. Kubanek and S. H. Ruskin, Eloise, Mich.—p. 698.
Early Symptoms of Aphasia with Brain Tumors. M. Kanzer, New York. —p. 702.
Pyramidal Tract: Effect of Precentral and Postcentral Cortical Lesions on Fiber Components of Pyramids in Monkey. A. M. Lassek, Charleston, S. C.—p. 721.
Anancastic Depressions: Obsessive-Compulsive Symptoms Occurring During Depressions. E. G. Lion, San Francisco.—p. 730.

Neurologic Aspects of Simple Mastoiditis.—One hundred and twelve patients with uncomplicated mastoiditis were examined by Trowbridge for neurologic signs and symptoms including headaches, nausea and vomiting, changes in the fundi, nystagmus, and alteration in reflexes and cranial nerves. Abnormal neurologic signs were rare. This is in sharp contrast to the observations of Nielsen and Courville in a seemingly comparable series of patients.

Journal of Nutrition, Philadelphia

23:425-532 (May) 1942

Effect of Aromatic Hydrocarbons on Growth of Young Rats. H. D. West and N. C. Jefferson, Nashville, Tenn.—p. 425.
Fate of Excess Vitamin A Stores During Depletion: Value of the Histologic Demonstration of Vitamin A. H. Popper and Sadie Brenner, Chicago.—p. 431.
Effect of Manganese on Calcification in the Growing Rat. Charlotte Chornock, N. B. Guerrant and R. A. Dutcher, State College, Pa.—p. 445.
Relation of Liver Stores to Occurrence of Early Signs of Vitamin A Deficiency in the White Rat. Sadie Brenner, Margaret C. Hessler Brookes and Lydia J. Roberts, Chicago.—p. 459.
Factors Influencing the Onset and Cure of Nutritional Muscular Dystrophy. S. H. Eppstein and S. Morgulis, Omaha.—p. 473.
Daily Intake of Ascorbic Acid Required to Maintain Adequate and Optimal Levels of This Vitamin in Blood Plasma. Margaret L. Fincke and Virginia L. Landquist, with technical assistance of Phyllis M. Carpenter, Corvallis, Ore.—p. 483.
Studies of the Vitamin B Complex in Nutrition of the Dog. A. E. Schaefer, J. M. McKibbin and C. A. Elvehjem, Madison, Wis.—p. 491.
Availability to Rats of Phosphorus in Red Clover Hays of Widely Varying Phosphorus Content. D. E. Williams, F. L. MacLeod and E. Morrell, Knoxville, Tenn.—p. 501.
Alpha-Tocopherol Requirement of the Mouse. Marianne Goettsch, San Juan, Puerto Rico.—p. 513.
Certain Relationships of Avitaminosis A to Vitamin C in the Young Bovine. P. D. Boyer, P. H. Phillips, W. D. Pounden, C. W. Jensen, I. W. Rupel and M. E. Nesbit, Madison, Wis.—p. 525.

Journal of Pharmacology & Exper. Therap., Baltimore

75:1-104 (May) 1942. **Partial Index**

Antihistamine Activity of Thymoxyethyldiethylamine and n'Ethyl-n'-Diethylaminoethylaniline as Judged by Gastric Response to Histamine. H. B. Burchell and R. L. Varco, Minneapolis.—p. 1.
Comparison of Effects of Epinephrine on Blood Pressure When Injected into Vein and When Injected into Marrow Cavities of Bone. M. E. Drake and C. M. Gruber, Philadelphia.—p. 6.
Stimulating Influence of Sodium Citrate on Cellular Regeneration and Repair in Kidney Injured by Uranium Nitrate. G. L. Donnelly and R. L. Holman, Chapel Hill, N. C.—p. 11.
Effects of Some Anesthetic Agents on Volume of Body Fluid. D. D. Bonnycastle, Toronto, Canada.—p. 18.
Anesthesia: VI. Anesthetic Action of Cyclopropyl Vinyl Ether. J. C. Krantz Jr., W. E. Evans Jr., S. E. Forman and H. L. Wollenweber, Baltimore.—p. 30.
Studies on Pain: Measurement of Effect of Ethyl Alcohol on Pain Threshold and on "Alarm" Reaction. H. G. Wolff, J. D. Hardy and H. Goodell, New York.—p. 38.
Action of Senecionine, Integerrimine, Jacobine, Longilobine and Spartiodine, Especially on Liver. P. N. Harris, R. C. Anderson and K. K. Chen, Indianapolis.—p. 69.
Sulfonamide Therapy of Malaria in Ducks. E. K. Marshall Jr., J. T. Litchfield Jr. and H. J. White, Baltimore.—p. 89.

Laryngoscope, St. Louis

52:341-422 (May) 1942

Sulfanilamide in Otitis Media in Children: Further Report on Controlled Series. E. B. Bilchick and G. H. O'Kane, New York.—p. 341.
Autopsy Studies of Case of Tuberculous Peripharyngeal Abscess. S. Iglauer, Cincinnati.—p. 346.
Surgical Aspects of Carcinoma of Larynx. J. D. Kernan, New York. —p. 353.
Office Treatment of Vertigo (Histamine Therapy). J. J. Shea, Memphis, Tenn.—p. 362.
Fractures of Maxillary Bones. D. B. Parker, New York.—p. 365.
Hemangioma of Antronasal Sinus Successfully Treated by Radium. S. Morse, New York.—p. 371.
*Two Unusual Symptoms of Eyestrain. J. R. Noyes, Brockton, Mass.—p. 376.
Progressive Deafness: Abstract Summary of Available Literature Published During 1941. E. H. Campbell and L. E. Silcox, Philadelphia. —p. 380.

Two Unusual Symptoms of Eyestrain.—Noyes has relieved several patients of annoying tinnitus by correcting hyperopia, astigmatism and presbyopia. The relief of eyestrain will not cure all patients of tinnitus, but if the possibility of its presence is carefully considered many patients can be relieved by the correction of refractive errors and muscular imbalance. Globus hystericus is another symptom of eyestrain which is not commonly considered as such. Many such patients have been relieved by properly fitted glasses.

Maine Medical Association Journal, Portland

33:113-148 (June) 1942

Records: Problem of Every Hospital. Pearl R. Fisher, Waterville.—p. 113.
Laceration of Abdomen with Ectopia Viscera. N. Bisson, Waterville. —p. 116.

Medical Annals of District of Columbia, Washington

11:167-206 (May) 1942

Diseases of Pancreas: II. Chronic Diseases. R. J. Coffey, Washington.—p. 167.

Etiology and Treatment of Gas Gangrene. J. O. Warfield Jr., Washington.—p. 175.

Androgen Therapy of Agitated Depressions in Male. L. Danziger and H. R. Blank, Sykesville, Md.—p. 181.

Office Gynecology. J. Kotz, Washington.—p. 184.

Palindromic Rheumatism: Report of Two Cases. J. L. Thompson Jr., Fort Belvoir, Va.—p. 189.

Medicine, Baltimore

21:95-206 (May) 1942

Pathogenesis of Paralysis Agitans (Parkinson's Disease). C. E. Benda, Wrentham, Mass., and S. Cobb, Boston.—p. 95.

Ecology of Plague. K. F. Meyer, San Francisco.—p. 143.

Ecology of Psittacosis and Ornithosis. K. F. Meyer, San Francisco.—p. 175.

Military Surgeon, Washington, D. C.

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Medical Service with the Horse Mechanized Cavalry. C. B. Daugherty.—p. 621.

Surgical Service of the Swiss Army. E. Wildbolz.—p. 626.

Nature's Way: II. Resistance to Disease. V. Safford.—p. 630.

Trichinosis: Report of Outbreak at Camp Edwards, Mass. A. Marble, A. P. Skoog and D. J. Bucholz.—p. 636.

Acute Thyroid Crisis Associated with Bronchopneumonia: Case. G. B. Moore Jr. and A. J. Tannenbaum.—p. 643.

Chemotherapy in Gunshot Wounds of Face, Neck and Jaws. M. W. Ogle.—p. 650.

Treatment of Hemorrhoids in Military Hospital. W. F. Bowers and H. C. Schwyzer.—p. 655.

*Sulfathiazole Single Massive Dose Therapy of Acute Gonorrheal Urethritis in the Male. J. P. Pappas.—p. 662.

Wartime Concepts of Mobile Field Laboratory. D. H. Drummond.—p. 668.

Vision Test Card Designed for Use in Examinations for Armed Forces. J. I. Moore.—p. 684.

Single Massive Dose of Sulfathiazole for Acute Gonorrheal Urethritis.—Pappas evaluated the advantage of a single massive oral dose of sulfathiazole in the cure of uncomplicated gonorrhea, especially in active military operations, by treating 28 soldiers with an acute previously untreated infection and 5 whose disease had not responded to previous sulfonamide therapy. The alleged period of symptoms in 13 of the 28 ranged from one to twelve, with an average of four and nine-tenths days, while in the 15 who presented only an anterior urethral infection it averaged one and six-tenths days. A single dose of 5 Gm. of sulfathiazole was given to the first 5, 6 Gm. to the next 15 and 7 Gm. to the last 8. Phenobarbital 0.065 Gm. was administered routinely to all patients about half an hour prior to the drug. Fluids, to 4 liters a day, were forced for several days following chemotherapy. Twenty-three of the 28 patients, while only 2 of the 5 patients who had had prior chemotherapy, were cured. Smears became negative for the gonorrheal organism, the urethra was dry and the urine of two-glass tests was clear after an average of two and six-tenths, six and six and five-tenths days, respectively. The average figures indicate that the patients could have been returned to duty in seven and three-tenths days, having been "dry" for about two days and having had both urines clear on two successive mornings. The author feels that similar results could have been obtained without the patients having lost any time from duty except for the day of chemotherapy. The 5 Gm. dose of sulfathiazole appeared to be as efficacious as the higher doses. During a follow-up period of nine months not 1 patient had a relapse. There was one reinfection of a patient who had been asymptomatic for six and a half months. The patients have been classified as cured. The results emphasize, by implication, that the initial dose of sulfonamides should be high if drug resistant infection is to be prevented. The method promises to be of extreme value in early acute gonorrheal infection, particularly during active military operations and in persons who cannot be controlled for even a moderately prolonged course of chemotherapy.

Missouri State Medical Assn. Journal, St. Louis

39:159-192 (June) 1942

Medical Profession in Wartime: Address of the President. R. B. Denny, Creve Coeur.—p. 159.

Medicine Today: Address of the President Elect. H. L. Kerr, Crane.—p. 161.

Thoughts on Prevention of Coronary Disease. O. P. J. Falk, St. Louis.—p. 162.

Role of Chemotherapy in Treatment of Obstetric and Gynecologic Conditions. P. F. Fletcher, St. Louis.—p. 164.

Vernal Conjunctivitis: Brief Review of Literature. C. T. Eber, St. Louis.—p. 171.

Public Health Reports, Washington, D. C.

57:641-684 (May 1) 1942

Story of National Leprosarium (U. S. Marine Hospital), Carville, La. G. H. Faget.—p. 641.

Anaphylaxis in Guinea Pigs Following Sensitization with Chick Embryo Yellow Fever Vaccine and Normal Chick Embryos. T. O. Berge and M. V. Hargett.—p. 652.

57:685-728 (May 8) 1942

Health Agencies—Their Responsibilities and Their Opportunities During the Present Crisis. P. V. McNutt.—p. 685.

Opening Remarks to the Fortieth Annual Conference of the United States Public Health Service with the Conference of State and Territorial Health Officers. T. Parran.—p. 691.

Use of Mucin in Experimental Infections of Mice with Vibrio Cholerae. J. J. Griffitts.—p. 707.

Prevalence of Poliomyelitis in the United States in 1941. C. C. Dauer.—p. 710.

57:729-772 (May 15) 1942

An Epidemiologic Study of Poliomyelitis in Mississippi in 1941. L. L. Lumsden.—p. 729.

Five Fumigants for Disinfestation of Bedding and Clothing: Comparative Study of Insecticidal Properties. G. C. Sherrard.—p. 753.

Review of Gastroenterology, New York

9:165-256 (May-June) 1942

Inactivation of Pepsin and Its Relation to Peptic Ulcer. S. A. Komarov, Montreal, Canada.—p. 165.

Effect of Duodenal Ulcer with Obstruction on Motor Activity of the Human Stomach. F. E. Hamilton and G. M. Curtis, Columbus, Ohio.—p. 176.

Physiology of Enterocrinin. E. S. Nasset, Rochester, N. Y.—p. 188.

*Diagnosis and Treatment of Chronic Gastritis. C. L. Jackson, W. A. Swalm and L. M. Morrison, Philadelphia.—p. 193.

Spastic Constipation. P. L. Eneboe, Bozeman, Mont.—p. 198.

Intragastric Photographs in Natural Color: Preliminary Report. H. A. Rafsky, New York.—p. 202.

Max Einhorn: On the Eightieth Anniversary of His Birth. H. I. Goldstein, Camden, N. J.—p. 203.

Max Einhorn. G. Mannheimer, New York.—p. 206.

Report of Two Cases of Probable Syphilitic Peptic Ulcers and Their Management. M. Einhorn and H. A. Rafsky, New York.—p. 208.

Remarks on Evaluation of Achylia Gastrica (Einhorn). J. Kaufmann, New York.—p. 214.

Differential Diagnosis Between Abdominal Aneurysm and Other Abdominal Diseases. F. M. Groedel, New York.—p. 219.

Importance of the Duodenal Tube for Diagnosis and Treatment. C. I. Krieger, New York.—p. 223.

Adequate Standards of Nutrition. H. Pollack, New York.—p. 226.

Some Vascular Responses Within the Liver and Their Interpretation. C. D. Snyder, Baltimore.—p. 230.

Critical Study of Diagnostic Procedures in Gallbladder Disease. C. J. DeLor, J. W. Means, G. Y. Shinowara and E. J. Booth, Columbus, Ohio.—p. 239.

Diagnosis and Treatment of Chronic Gastritis.—The past five years have seen a rapid reevaluation of the status of chronic gastritis. According to Jackson and his associates, the clinical syndrome ranges widely and often embraces many generalized and vague abdominal symptoms. The complaint frequently includes generalized upper abdominal distress, nausea, pyrosis, anorexia, loss of weight, constipation and the like. The symptoms often center about vague or mild midabdominal or upper abdominal pain, gassy distress, a feeling of epigastric fulness, pressure or discomfort. Sharp, sticking, gnawing or burning pain is complained of occasionally; colicky, spasmodic pain occurs rarely and only in the intractable cases. Pain distress was present in 75 per cent of their patients selected from over a thousand gastroscopic studies. There is no particular meal relationship, the pain being at times intermittent and at other times constant. The symptoms are variable in duration. Anorexia, indifference to food or fear of eating because of ensuing distress was present in 45 per cent of the cases, loss of weight was noted in 33 per cent, weakness or ease of fatigability was felt in 25 per cent, nervousness was complained of in 55 per

cent, nausea or vomiting was observed in 22 per cent and constipation or diarrhea in 40 per cent. Frequent nonulcerous occurrence of the peptic ulcer syndrome in cases of chronic gastritis has been described recently. The atrophic variety of gastritis in the nonanemic patients is particularly interesting because of the predominating role of "nervousness" in the patient's complaint. No pathognomonic or constant acid value to the Ewald fractional method has been observed in gastritis. Atrophic gastritis was more frequently associated with achlorhydria or hypochlorhydria, hypertrophic gastritis was more frequently found with hyperchlorhydria or normal acidity; the superficial, catarrhal, congestive, erosive and ulcerative forms vary widely. There was an increase in mucus in 32 per cent of the cases. Positive occult blood reaction occurred in 81 per cent. The x-ray method was of diagnostic value in only about 10 per cent of cases, and these were usually of the hypertrophic variety. The only reliable means of diagnosing chronic gastritis is by the semiflexible gastroscope. The authors employed a new method. It consisted in obtaining a biopsy specimen of the gastric mucosa through the open tube gastroscope from patients in whom the diagnosis of gastritis had been previously made by the closed semiflexible (Wolf-Schindler) gastroscope. When gastritis had been visualized through the gastroscope, the authors often received an unbiased report from the pathologist of definite evidence of gastritis. The authors describe methods of treatment of chronic gastritis, including elimination of etiologic factors, diet, medication, physical therapy and surgery.

Surgery, St. Louis

11:671-840 (May) 1942

*Local Implantation of Sulfanilamide in Peritoneal Cavity and Its Clinical Application in Peritonitis. K. Tashiro, O. B. Pratt, N. Kobayashi and G. K. Kawaichi, Los Angeles.—p. 671.
*Effect of Sulfanilamide Crystals, Used Topically, on Fate of Transplanted Bone: Some Experimental and Clinical Observations. T. Horwitz, Philadelphia.—p. 690.
*Employment of Cotton Suture Material in the Field. R. S. Sparkman and W. H. Williams, Fort George G. Meade, Md.—p. 698.
Use of Estrogenic Substances in Preoperative and Postoperative Treatment of Hyperthyroidism. A. H. Storck and R. G. Holcombe Jr., New Orleans.—p. 703.
*Skeletal Manifestations of Thyroid Disease. M. Bodenheimer and I. S. Barcham, New York.—p. 710.
Cephalin-Cholesterol Flocculation Test in the Jaundiced Patient. S. B. Nadler and M. F. Butler, New Orleans.—p. 732.
Evaluation of Intestinal Suction in Intestinal Obstruction. J. B. Blodgett, Boston.—p. 739.
Study on Mechanism of Action of Prostigmine on Intestinal Motility in the Human Being and the Dog. A. H. Schwartz, I. Reingold and H. Necheles, Chicago.—p. 746.
Experimental Investigation of Gastrointestinal Secretions and Motility Following Burns and Their Relation to Ulcer. H. Necheles and W. H. Olson, Chicago.—p. 751.
Nervous Factor in Etiology of Shock in Burns. H. Kabat and R. F. Hedin, Red Wing, Minn.—p. 766.
*Hemorrhagic Cysts of Lung: Report of Two Cases in Which Marsupialization Was Done. H. K. Gray and I. C. Skinner, Rochester, Minn.—p. 777.
Paravertebral Thoracoplasty for Treatment of Pulmonary Tuberculosis: Report of 146 Cases with Follow-Up. G. C. Adie, L. C. Huested, W. G. Childress and H. E. Perez, Valhalla, N. Y.—p. 788.
Surgical Treatment of Large Carbuncles in Diabetic and Nondiabetic Individuals: Report of Twenty Cases. C. W. McLaughlin Jr., Omaha.—p. 797.
Localization of Bismuth in Kidney. H. Kroll, R. A. Arens, S. Mesirow, S. F. Strauss and H. Necheles, Chicago.—p. 810.
Unilateral Hypertrophy of Masseter Muscle. R. J. Coffey, Washington, D. C.—p. 815.

Sulfanilamide in Peritoneal Cavity.—Tashiro and his co-workers implanted sulfanilamide into the abdomen in 30 cases of peritonitis and appendical abscess. In experiments on rabbits the average maximal concentration in the blood was 22 mg. per hundred cubic centimeters in animals which had received 1 Gm. intraperitoneally. There was a rapid fall in the intraperitoneal concentration as the blood concentration increased; at about six hours the concentration in the blood about equaled that in the peritoneal cavity, after which the blood concentration exceeded the peritoneal concentration. The maximal blood concentration was reached almost uniformly in three hours in patients as compared to four hours in rabbits. In older individuals the gradient was not as steep, perhaps because of natural cardiovascular and renal changes. No significant gross or microscopic pathologic changes were seen in the intestine or peritoneum of rabbits following direct contact of these tissues with sulfanilamide crystals by intraperitoneal implantation. Pus and infective material were aspirated from the abdomen of patients with peritonitis, all possible gangrenous tissue was removed and the regional abdomen was cleansed by repeated perfusion with warm isotonic solution of sodium chloride and suction. Crystalline sulfanilamide, 4 to 10 Gm., depending on the age of the patient, was implanted directly in the area of greatest infection; 2 to 3 Gm. was used to coat wound layers and surfaces before the incision was closed. Pus by itself was no indication for drainage. Drains were used when irremovable gangrenous tissue or tissue of doubtful viability could not be removed. Supplemental sulfanilamide therapy was continued orally after the first postoperative day, or parenterally when a patient was unable to take it orally. There were no untoward reactions or intra-abdominal complications, wounds healed by primary intention and the patients were discharged promptly after a smooth postoperative course. The intraperitoneal use of sulfanilamide appears to be a safe, rational and effective procedure.

Topical Application of Sulfanilamide Crystals.—Experimental evidence and clinical proof that local use of sulfanilamide powder has no adverse effect on the fate of transplanted bone is presented by Horwitz, who used the drug on 18 adult rabbits and 5 patients in whom massive bone grafts were employed. Three patients had a distinct infection at the time of operation, 1 was potentially infected and 1 was clean without a history of preceding infection and had had a bone graft for a tuberculous spondylitis. In all the operative procedure was completed with primary closure of the wound after local implantation of 4 to 16 Gm. of powdered sulfanilamide. The level of sulfanilamide in the blood was maintained by the oral route for one week postoperatively. The infection of the 3 infected patients was completely controlled, and all wounds of the 1 with potential infection healed by primary intention. Of the 4 patients for whom bone grafts were employed for arthrodesing purposes the transplanted bone became well incorporated and fusion was solid by the fourth postoperative month. The fifth patient, with tibial nonunion, has thus far had most satisfactory incorporation (solid union) of the graft. The clinical results corroborate the experimental evidence and indicate that the local use of powdered sulfonamide compounds exerts no untoward or deleterious effect on the fate of a bone graft.

Cotton as Suture Material.—The circumstances under which major surgical procedures were performed during the maneuvers of the United States Army in North and South Carolina in the fall of 1941 in a tent hospital, Sparkman and Williams point out, were comparable to those which might be encountered in the field at wartime. The problems of dust and insect control were considerable. As the circumstances predisposed to wound contamination, the added protection of a nonabsorbable suture material seemed desirable, in view of limited nursing facilities and the possible necessity of evacuating patients over long distances to station hospitals early in convalescence. Cotton was chosen. During the encampment, from October 26 to December 5, one hundred and twenty-four appendectomies were performed. Ordinary nonmercerized cotton was employed as the only suture material with the exception that fine plain catgut was used for ligating the appendical stump when it was inverted. The McBurney incision was used exclusively. There were no deaths. The cotton was sterilized by boiling for twenty minutes or by autoclaving for fifteen minutes at 15 pounds pressure. Size 80, usually black, was used for closing the skin, size 100 white for ligating blood vessels immediately beneath the skin and size 50 or 80 for closing the remaining layers of the McBurney incision. The peritoneum was closed with a continuous suture; otherwise interrupted sutures were used. The appendical stump was not inverted in 20 instances; inversion in the 104 was accomplished with size 50 or 80 cotton. When perforation, gangrene of the appendix or extensive suppuration was present, 8 Gm. of sulfathiazole or sulfanilamide powder was implanted in the peritoneal cavity. The drugs were never placed in the wound itself. The wound was always copiously irrigated with isotonic solution of sodium chloride after each layer was closed. Of the 124 specimens removed, 79 showed micropathologic evidence of acute suppuration and 27 of the 79 showed gross evidence of gangrene at

operation. There were 2 instances of perforation, and gross contamination occurred in 2 because of disruption in continuity of the wall of a gangrenous appendix during removal. In each of these 4 cases a narrow soft rubber dam was placed down to the peritoneum, which was closed. The drains were removed on the fourth or fifth postoperative day, after which each wound healed by first intention. The peritoneal cavity and the wound of the other 120 patients was closed without drainage, and they were evacuated to station hospitals after a postoperative observation of eight days. A small collection of uninfected serous fluid was evacuated from the wound on one occasion from 3 of the 120 patients, and 1 had a left femoral thrombophlebitis on the sixth postoperative day and the wound disrupted on the thirteenth postoperative day. One other patient suddenly had generalized peritonitis on the fifth postoperative day and the abdomen was reopened. An abscess had formed about the noninverted appendical stump and the abscess had ruptured into the peritoneal cavity. The peritoneum, however, was sealed and the wound at this time was healing by primary intention. Convalescence and wound healing were uneventful after the abscess was drained. No attempt was made to remove the cotton sutures introduced at the first operation. Patients were allowed out of bed on the second or third postoperative day with no ill effects. Such early locomotion would not have been possible unless a nonabsorbable suture had been used as added security. The results support the contentions of Meade and Ochsner that cotton may be employed safely in clean, contaminated or infected wounds.

Skeletal Manifestations of Thyroid Disease.—Bodenheimer and Barcham review the literature and present 6 cases to illustrate osseous changes in thyroid disease. Not infrequently a bone lesion is diagnosed without appreciation of relationship to thyroid disease. Pulsating tumors may be diagnosed as aneurysm, hemangioma, meningocele or some other highly vascular tumor. The lesions are sometimes found on microscopic study to be secondary metastatic thyroid deposits occurring many years after the primary lesion was discovered or even without its discovery. The question of thyroid deposits in bone ever having been a metastasis or an aberrance is still open. Bony lesions of thyroid origin also have simulated hyperparathyroid lesions, endothelioma or multiple myeloma. Of all the skeletal manifestations of hypothyroidism the one most often unrecognized is epiphysial stippling. The characteristic pathologic changes of deficiency in centers of ossification with irregular bone growth and other characteristic changes at the epiphysial plate serve to differentiate it from Legg-Calvé-Perthes disease. Spontaneous fractures or fractures with little exciting cause have been reported in the decalcified bones of patients with long-standing hyperthyroidism. Needling of so-called aneurysms of the spine will be attempted less often when it is realized that these lesions are often due to a thyroid metastasis. Thyroid substitution therapy in the presence of stippled epiphyses is a great aid when definite evidence of hypothyroidism is established. Osteoporosis due to hyperthyroidism is sometimes benefited by thyroidectomy.

Hemorrhagic Cysts of Lung.—Hemorrhagic cysts of the lung may be congenital, infectious, mechanical or neoplastic. Various methods have been devised to meet the problems that arise in the management of the patient with a hemorrhagic cyst of the lung. Marsupialization may result in benefit when the cyst cannot be removed. Gray and Skinner report 2 cases in which such a procedure was beneficial. Three months after the operation the first patient was feeling well, roentgenograms showed considerable clearing of the exudate and diminution of the pleuritis, the right portion of the diaphragm was elevated by pleuritic adhesions and the cystic cavities were somewhat decreased in size. The second patient withstood the operative procedure well, he was permitted to sit in a chair on the eleventh postoperative day, he was afebrile and his general condition was excellent. Large quantities of clotted black blood drained from the marsupialized region. It is hoped that by marsupialization of the walls of the two cysts the uninvolved portion of the lung can be made to reexpand and obliterate the cystic cavities.

Texas State Journal of Medicine, Fort Worth

38:1-58 (May) 1942

*Fungus Disease of Lung. C. J. Koerth, R. G. McCorkle and J. M. Donaldson Jr., San Antonio.—p. 8.
Occupational Dermatoses. E. C. Fox, Dallas.—p. 14.
Treatment of Congenital Syphilis. W. P. Killingsworth, Port Arthur. —p. 17.
Study of Lymphosarcoma and Leukemias, Including Two Chloromas. L. L. Griffin and P. Brindley, Galveston.—p. 22.
Periureteral Abscess. M. K. O'Heeron, Houston.—p. 27.
Uterine Inertia. C. A. Smith, Texarkana.—p. 32.
*Pregnancy Complicated by Hookworm Disease: Report of Six Cases. R. A. Johnston and G. F. Adam, Houston.—p. 35.
Curable Heart Disease. L. C. Carter, Marlin.—p. 39.
Theca Cell Tumor of Ovary. U. J. Dowling, Sweetwater.—p. 41.

Fungus Disease of Lung.—Pulmonary conditions which simulate pulmonary tuberculosis, according to Koerth and his co-workers, are fungus disease, abscess, primary carcinoma, bronchiectasis and silicosis. Symptoms, treatment and the physical and roentgen signs of 4 cases of monilia, aspergillus and actinomycotic infection are discussed. The clinical symptoms of pulmonary moniliasis range from a simple dry cough up to and including all symptoms found in advanced pulmonary tuberculosis. The physical and roentgen signs are as variable as the clinical symptoms and depend on the stage of the disease. No clinical symptom or physical or roentgen sign is diagnostic of the disease. Potassium iodide given three times a day in increasing doses to the point of tolerance is the time honored drug. Actinomycoses may easily cause confusion when found in the sputum because of their close similarity to tubercle bacilli. The fragments of the mycelium usually are more variable in length and size than the tubercle bacillus. Furthermore, some of the segments will be seen to branch if the sputum is examined carefully. This organism is less resistant to decolorization with acid than the tubercle bacillus. Four types of pulmonary actinomycosis are recognized: the bronchitic, the pneumonic, the pleuropneumonic and the metastatic; this classification calls attention to successive stages of the same process. Treatment is discouraging and consequently a multitude of remedies has been proposed. Surgery does not produce striking results in the pulmonary type. Aspergillosis is distinctly related to occupations in which there is prolonged exposure to grain dusts. Two types of pulmonary aspergillosis are encountered: the superficial type includes aspergillary catarrh and bronchitis, and the deep form causes necrosis and caseation of the pulmonary tissue. The onset of aspergillosis is insidious with symptoms of cough, asthmatic attacks and anorexia. As the disease progresses, the cough increases in severity and the sputum becomes tenacious and may be dotted with black specks which are conidia. Weight loss, an evening elevation of temperature, hemoptysis and night sweats may occur. In the asthmatic form progressive dyspnea disables the patient. The course of the disease is chronic, and pulmonary tissue is slowly destroyed until secondary infection supervenes. Potassium iodide orally, inhalation of ethyl iodide, neoarsphenamine intravenously, bismuth compounds intramuscularly and roentgen radiation constitute some of the therapeutic measures.

Pregnancy Complicated by Hookworm Disease.—Whenever a severe anemia, in the absence of any tangible cause, is encountered in pregnancy an intestinal parasitic infection, especially hookworm, should be considered, as pointed out by Johnston and Adam. It is seen most frequently in charity clinics, especially among patients coming in contact with the soil. The usual port of entry is through the skin. Wickramasuriya states that hookworm disease is second to none as a cause of death or chronic invalidism in Ceylon. Most of the cases in this country are seen in the Southern states. Of the 6 cases of hookworm disease encountered by the authors, 3 were from a private practice of 6,350 cases and 3 were from the charity clinic at Hermann Hospital. If routine stool examinations, as is the present practice, had been done possibly more cases would have been found. The chief characteristic of the disease is anemia, the hemoglobin being as low as 15 per cent in some patients. The second important characteristic is toxemia of pregnancy, the severity of which depends on the severity of the infection and on the degree of anemia. The finding of hookworm ova in the stool makes the diagnosis

absolute. The blood urea is usually abnormally high (average 32 per cent in 37 patients observed by Wickramasuriya) and the urea concentration is usually below 2 per cent. Treatment consists in combating anemia and eradicating the offending organism. Carbon tetrachloride is not to be used when pregnancy coexists.

Virginia Medical Monthly, Richmond

69:291-350 (June) 1942

Clinical Pathologic Conference. L. Hamman, Baltimore.—p. 293.
*Neurosurgical Management of Epilepsy. J. M. Meredith, Richmond. —p. 299.
Our Health, Yesterday and Today: Study of Acute Otitis Media and Mastoiditis and Their Relation to Public Health. J. W. Woodward Jr., New York.—p. 307.
Regional Ileitis: Report of Case. J. S. Horsley, Richmond.—p. 314.
Carcinoma of Thyroid. A. M. Smith Jr., Charlottesville.—p. 318.
Central Nervous System Symptoms Associated with Measles in an Adult: Case Report. J. R. Hamilton, Nassawadox.—p. 324.
Gastric Hypoacidity. R. H. Temple, Kinston, N. C.—p. 326.
*Treatment of Lung Abscess. J. K. Bradford, Schenectady, N. Y.—p. 329.
Lignin Test for Sulfonamides. L. I. Hallay, Fort Blackmore.—p. 334.

Neurosurgical Management of Epilepsy. — Meredith points out six major causes of surgical epilepsy: (*a*) congenital, (*b*) neoplastic, (*c*) inflammatory, (*d*) post-traumatic, (*e*) vascular and (*f*) degenerative brain lesions. Examples of each type are presented. The value of electroencephalography in the diagnosis of surgical lesions of the brain causing convulsions is discussed. The electroencephalogram will practically always localize a cortical lesion, whether it is above or below the tentorium, but it will not show whether it is of surgical significance or not; i. e., it is just as apt to show abnormal waves overlying cerebral softening and gliosis due to a cerebral thrombosis as it will with tumor. It repeatedly has localized cerebellar and cerebral tumors in doubtful cases (as to clinical localization) with disappearance of the electroencephalographic focus after operation. The electroencephalogram frequently fails to localize subcortical tumors or other mass lesions below the cortex wherever they may be in the brain. An electroencephalographic focus demonstrated in a patient with generalized convulsions (in whom a pneumoencephalogram fails to show a significant lesion) will usually prove to be of little importance if operation is carried out over the suspected site (as demonstrated by the electroencephalogram) and only indifferent postoperative results are to be expected in such cases, particularly with respect to the subsequent elimination of the convulsions, unless quite radical procedures, such as an ablation of the motor cortex, are performed. As emphasized by Holland, the electroencephalogram is only one of the many diagnostic aids in the investigation of epileptic patients and is not to be considered a substitute for the all important air injections which are almost invariably carried out before operation on patients with convulsive disorders.

Treatment of Lung Abscess.—Bradford shows that abscess of the lung is a serious disease which under generally accepted medical treatment has resulted in extensive pulmonary damage and a high mortality rate. Early surgical drainage has brought about a striking reduction in this mortality rate. Most cases of lung abscess follow operations on the upper respiratory tract or occur subsequent to pneumonias which do not resolve promptly. In the so-called idiopathic cases the incidence of oral infection is extremely high. Careful treatment of these varied entities is important in the prophylaxis of lung abscess. The bacteriology of lung abscess is complex. Isolation of the original infecting organism is virtually impossible. Anaerobic organisms, as secondary invaders, are responsible for maintaining and extending the disease. Synergism is probably an important factor. A knowledge of the pathology of lung abscess is essential to an understanding of previous failures in treatment and in carrying out a logical and successful treatment. Every case of lung abscess deserves a trial of medical treatment, provided adequate oxygenation and drainage can be established at once and maintained continuously. Failure to accomplish this is the indication for immediate surgical drainage. The external drainage of lung abscess cavities is a simple, logical and successful surgical procedure.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

39:1-32 (Jan.-March) 1942

Some Aspects of Blood Chemistry of the Nephritic Child. Anne E. Somerford.—p. 1.
Note on Cerebral Causes of Defects in Perception and Consciousness. F. P. Weber.—p. 15.

British Medical Journal, London

1:543-572 (May 2) 1942

Problem of Abdominal Pain, with Special Reference to Localization of Visceral Pain. F. R. Brown.—p. 543.
*Simple Method of Using Penicillin, Tellurite and Gentian Violet for Differential Culture. A. Fleming.—p. 547.
Pigment Metabolism Following Transfusion of Fresh and Stored Blood. Janet M. Vaughan.—p. 548.
Anesthesia for Air Raid Casualties. R. P. Harbord.—p. 550.
*Asthma Treated with Patient's Blood Serum. A. D. Lapp.—p. 552.

Simple Method for Differential Culture.—Fleming points out that by spreading a small quantity of methylrosaniline over half of the culture plate of blood agar after it has been planted it is possible to isolate a few streptococci from among the multitude of staphylococci, just as it is when methylrosaniline is incorporated in the medium. When this technic is used it is necessary to start spreading the chemical used where the inoculum is lightest and to proceed toward the heavier inoculum; otherwise there may be so many resistant bacteria that a confluent sheet of growth ensues. The three chemicals that can be used in this way are penicillin, potassium tellurite and methylrosaniline. The advantages of such spreading of one of these chemicals are that special mediums need not be prepared and that one half of the culture plate is an ordinary culture and the other half a selective culture.

Asthma Treated with Patient's Blood Serum.—Using a sterile syringe and test tube or a vacuum venule, Lapp withdraws about 30 cc. of blood from a patient suffering from asthma. The blood is allowed to clot at room temperature for two hours. It is then stored in a refrigerator. Serum is drawn off the top as required and injected subcutaneously. A much firmer clot is formed as treatment progresses and proportionately more serum is expressed. No local or general reaction was noticed. Many patients who were treated for hay fever by this method remained free from colds for long periods, although they had previously been most susceptible.

Edinburgh Medical Journal

49:209-272 (April) 1942

Observations on Eclamptic Toxemia and on Essential Hypertension and Chronic Nephritis in Pregnancy. D. Miller.—p. 209.
Acute Intestinal Obstruction from Clinical Standpoint. K. P. Brown. —p. 234.
Mammary Carcinoma with Cutaneous Carcinosis of Erysipelatodes Type. E. K. Dawson and T. M. Davie.—p. 247.
Thomas Dover (1660-1742). M. P. Russell.—p. 259.
Dover's "Legacy." T. H. Howell.—p. 266.

Journal of Mental Science, London

88:275-386 (April) 1942

Investigation of Personality in Patients Treated by Prefrontal Leukotomy. E. L. Hutton.—p. 275.
Some Preliminary Remarks on Prefrontal Leukotomy. G. W. T. H. Fleming.—p. 282.
Forms of Behavior of Electrical Resistance of Skin Related to Certain Psychiatric and Endocrine Conditions. R. E. Hemphill.—p. 285.
Measurement of Body Resistance by Bridge Methods. W. G. Walter. —p. 306.
Auxiliary Genes for Determining Sex as Contributory Causes of Mental Illness. L. S. Penrose.—p. 308.
Measurement of Dementia. M. B. Brody.—p. 317.
*Psychiatric Syndromes Following Blast. E. W. Anderson.—p. 328.
Arhinencephaly with Incomplete Separation of Cerebral Hemispheres. G. W. T. H. Fleming and R. M. Norman.—p. 341.

Psychiatric Syndromes Following Blast.—Anderson discusses psychiatric symptoms in 8 cases that followed close exposure to the detonation of a high explosive bomb. In each there were certain common features which from the psychiatric

angle indicated a relationship to structural cerebral changes. The relationship may be easily overlooked because in many cases a definite history of head injury and a long period of unconsciousness are absent. Evidence of an organic reaction was shown by (1) residual intellectual impairment, (2) memory changes, (3) slight and transient aphasia in 2 and (4) occasional changes in the cerebrospinal fluid. A degree of intellectual impairment, characterized by complaints of forgetfulness and lack of concentration, was present. Memory changes were by far the most striking part of the syndrome; in some the memory was imperfect for events immediately following the explosion, and in others there were periods of global amnesia. Such amnesia may have a definite medicolegal significance. None of the patients were observed immediately after the incident, but the patients reported that after the explosion they felt "dazed" or had "a numb sort of sensation." There is evidence that consciousness was clouded; in 1 or 2 patients it persisted for days or even months. Besides associated, probably constitutional, depressive features, affective lability and apathy were observed. The apathy was the more impressive. Some of the other symptoms were psychomotor changes, dementia, motor aphasia, dysphasia and depression. Little can be stated definitely as to prognosis. It may depend to a large extent on the promptness of treatment, which is based on the analogy of cerebral trauma; that is, at least a fortnight's complete rest in bed with appropriate sedation and the general measures for treating head injury. Coexistent or subsequent constitutional or psychogenic changes demand competent treatment on the usual psychiatric lines.

Journal of Pathology and Bacteriology, Edinburgh

54:149-288 (April) 1942

Malignant Tumors of Interstitial Cells of Testis in Strong A Mice Treated with Triphenylethylene. Georgiana M. Bonser.—p. 149.
Effect of Estrone on Mice of Three Inbred Strains, with Special Reference to Mammary Glands. E. W. Miller and F. C. Pybus.—p. 155.
Fat of Adrenal Cortex in Fasting Guinea Pigs and Rabbits. R. Whitehead.—p. 169.
Hyperparathyroidism in Experimental Nephritis. J. B. Dugoid.—p. 177.
Preparation of Loeffler's Medium in Relation to Morphology of Corynebacterium Diphtheriae. N. E. Goldsworthy and H. Wilson.—p. 183.
Isolation of Intestinal Pathogens by Selective Mediums. M. Hynes.—p. 193.
Diagnosis of Johne's Disease of Cattle by Cultural Methods. F. C. Minett.—p. 209.
Differentiation Between Members of Genus Vibrio by Bactericidal Technic. J. Gordon and K. I. Johnstone.—p. 221.
Acute Hemorrhagic Leukoencephalitis: Report of Case. R. A. Henson and Dorothy S. Russell.—p. 227.
Experiments of Shaking Bacteriophage. Margaret L. Campbell-Renton.—p. 235.
Paratyphoid Carriers: Infectivity of Feces and Failure of Chemotherapy with Sulfapyridine and Iodophthalein. H. D. Holt and H. D. Wright.—p. 247.
Diphtheria Diagnosis with Hoyle's Medium: Saponin and Sodium Dioctylsulfosuccinate as Hemolyzing Agents in Preparation of Medium. M. Y. Young.—p. 253.
Simple Medium for Isolation of Bacterium Dysenteriae. T. B. Gallie.—p. 256.
Rapid Method of Staining Myelin in Traumatic Neuromas and Injured Nerves. J. Anderson.—p. 258.
Tubes for Streptococcic Grouping. H. A. Tarr.—p. 259.
Unusually Weakly Reacting A Blood Group Antigen. G. L. Taylor, R. R. Race, Aileen M. Prior and Elizabeth W. Ikin.—p. 261.

Journal of Physiology, Cambridge

100:369-484 (March) 1942

Note on Interaction Between Nerve Fibers. B. Katz and O. H. Schmitt.—p. 369.
Assimilation of Radioactive Phosphorus Following Phosphorus Deficiency in Rats. W. E. Gaunt, H. D. Griffith and J. T. Irving.—p. 372.
Glycogen and Adipose Tissue. E. Tuerkischer and E. Wertheimer.—p. 385.
Ovulation in the Rabbit After Destruction of the Greater Superficial Petrosal Nerves. Marthe Vogt.—p. 410.
Action of Curare on the Respiratory Center. J. Fegler.—p. 417.
Influence of a Deficiency of Vitamin B_1 and of Riboflavin on the Reproduction of the Rat. Katharine Hope Coward, Barbara Gwynneth Emily Morgan and Letitia Waller.—p. 423.
Urea Formation in the Isolated Perfused Liver of the Rat. O. A. Trowell.—p. 432.
Olfactory Reactions in the Brain of the Hedgehog. E. D. Adrian.—p. 459.
Observations on the Properties of S-Methyl Iso-Thiourea Sulfate, with Particular Reference to the Circulatory Effects. M. McGeorge, M. Sherif and F. H. Smirk.—p. 474.

Lancet, London

1:493-522 (April 25) 1942

*Epilepsy Following Application of Sulfathiazole Near Brain. A. C. Watt and G. L. Alexander.—p. 493.
Neurosis in Soldiers: Follow-Up Study. A. Lewis and E. Slater.—p. 496.
*Use of Pholedrine at Major Operations. H. Dodd.—p. 498.
*Aneurine and Carbohydrate Metabolism in Diabetics. E. Kodicek.—p. 501.
Notes on Trichlorethylene Anesthesia. H. F. Griffiths.—p. 502.
Encephalopathia Arteriolosclerotica Basalis Lethargica. F. P. Weber and K. Blum.—p. 503.

Epilepsy Following Application of Sulfathiazole Near Brain.—Watt and Alexander warn against the use of sulfathiazole close to the brain, particularly in the frontal region. When sulfathiazole became available they applied it in the same manner as they had sulfapyridine: 2 to 3 Gm. of the powdered drug, sterilized in the autoclave, was insufflated into the wound after the dura mater was closed, both deep and superficial to the bone flap. The closure of the dura mater was, as usual, never complete enough to prevent cerebrospinal fluid from percolating through and thus gaining direct contact with the sufathiazole. All went well with their first 2 cases, and then postoperative complications, in the form of epileptic seizures in quick succession, beginning about two hours after operation, became intermittent. There were two deaths among the 5 patients exhibiting this symptom; that is five of the six frontal explorations in which sulfathiazole was used were complicated by postoperative epilepsy. In the frontal operation, not complicated by epilepsy, the thickened dura was not opened; this is significant. Four patients having lateral or posterior craniotomy in whose wounds sulfathiazole was also used did not have epilepsy, even 1 patient with a history of epilepsy. This epileptogenic property of sulfathiazole has been confirmed experimentally in cats; it is apparently not shared by sulfanilamide, sulfapyridine, sulfadiazine or sulfacetamide.

Use of Pholedrine at Major Operations.—Dodd discusses the restorative action of pholedrine, a pressor agent, on the blood pressure during and after major operations. Blood pressure records during operations have been made on 300 patients since 1932 and pholedrine was used in 89 of these. The effective dose of pholedrine was 0.2 to 0.25 cc. intravenously, 1 cc. intramuscularly and 0.2 to 0.25 cc. intravenously plus 0.75 to 0.8 cc. intramuscularly. Pholedrine given in these amounts as a single dose raised a low blood pressure to within 25 per cent of the normal in 89 per cent of patients. Pholedrine given in repeated doses (up to five) still raised the pressure to normal or over in 82 per cent of the patients. A useful rise was noted in almost all subjects when the correct dose was used. If the operation is long or shock is appreciable the intramuscular dose may be increased to 1.5 cc. No fall in pressure was observed after one hundred and twenty-six injections of the agent. Excessive rises can be avoided by correctly assessing the patient's condition and accurately estimating the dose. The patient's own recuperative power must be reckoned with and given time to act. Variability of the pulse after pholedrine was observed three times after the one hundred and twenty-six administrations, but otherwise no ill effects were encountered. Leptazol was ineffective by itself but when combined with pholedrine it had a powerful pressor effect.

Aneurine and Carbohydrate Metabolism in Diabetes.—Kodicek investigated under well controlled conditions the effect of aneurine (vitamin B_1) on the blood sugar of 32 middle aged patients with mild diabetes, with and without the addition of insulin, and analyzed statistically the blood sugar curves. They were all on a standard Joslin diet, most of them without previous insulin treatment. The effect of aneurine was examined on the fasting level of the blood sugar of 20 patients, and in 12 the combined action of aneurine and insulin was investigated. The results reveal that aneurine either alone or in combination with insulin does not exert any influence on the blood sugar of the diabetic patient, at least in thirty, sixty or one hundred and twenty minutes after its injection. That more prolonged administration of aneurine is also ineffective was suggested by the fact that 10 mg. given daily for four weeks to 2 patients did not improve their sugar tolerance or insulin

requirement. The results do not support the view that there is any direct interconnection between the disease and aneurine requirements, and they do not justify its use for the purpose of increasing the sugar tolerance of the diabetic patient. Diabetic diets may be often low in vitamin B_1 so that a partial deficiency requiring treatment with aneurine is likely to be an incidental accompaniment of diabetes.

Medical Journal of Australia, Sydney

1:425-452 (April 11) 1942

Prostatic Urethral Adenoma: Anatomic and Physiologic Considerations, Histology and Pathology. M. G. Sutton.—p. 425.
Leptospira Pomona. E. H. Derrick.—p. 431.
Discovery of a Fifth Australian Type of Leptospirosis. D. W. Johnson. —p. 431.
Some Aspects of Epilepsy. N. V. Youngman.—p. 433.
Sulfonamides in Gonorrhea. V. N. B. Willis.—p. 438.

1:453-482 (April 18) 1942

Heat Absorbing or Heat Lifting Capacity of Wind in Relation to Human Body, with Table for Calculating It. C. E. Corlette.—p. 453.
Note on Diagram for Calculation of Heat Absorbing Capacity of a Cubic Meter of Air, Based on Tables of Dr. C. E. Corlette. W. H. H. Gibson.—p. 464.
Notes on Use of Tourniquet. R. S. Lahz.—p. 465.
Mycobacterium Tuberculosis in Milk. O. Kudelka.—p. 466.
Operative Treatment of Hyperphoria. E. T. Smith.—p. 468.

1:483-512 (April 25) 1942

Standardization of Hemoglobinometers. J. D. Hicks.—p. 486.
*New Light on Painful Shoulder. M. Kelly.—p. 488.
New Method of Radiologic Localization of Foreign Bodies. T. L. Tyrer, with an addendum by C. W. B. Littlejohn.—p. 493.
A Regimental Aid Post in Tobruk. S. J. M. Goulston.—p. 494.

Painful Shoulder.—Kelly was able to relieve patients suffering from painful disability of the shoulder by percaine infiltration. A remarkably constant clinical picture is presented in the developed case. The main features are (1) pain in the shoulder on abduction of the humerus, (2) severe aching at night, (3) tenderness on the "point" of the shoulder. The pain on movement may vary in intensity; it may limit all movement or may be just a twinge when the humerus is near the horizontal while raised or lowered. It is usually felt near the insertion of the deltoid rather than in the joint itself. The aching at night is usually the chief complaint; the pain on movement is more easily borne. Examination usually reveals a point of tenderness on the greater tuberosity, which disappears under the acromion on abduction ("Dawbarn's sign"). This sign may be absent, or tenderness may be more widespread over the deltoid region. Crepitus may be felt in the shoulder on abduction. In severe cases of shoulder disability ("frozen shoulder") fixation of the joint, at first by muscular spasm and later by adhesions, may be present and trophic changes may become manifest in muscular wasting and decalcification of bone. Less than half of the patients give a history of an injury to the shoulder; this usually takes the form of a fall on the outstretched arm or the point of the shoulder ("stubbed shoulder"). The author detected a circumscribed area of tenderness in the trapezius and infiltrated it deeply and widely with procaine hydrochloride. Sometimes as much as 20 cc. of a 1:1,500 solution of "percaine" or a 1:200 solution of "novocain" is necessary. The injection often is painful, and the patient will frequently faint if he is not made to lie down beforehand. Ten cases were encountered in which infiltration proved unsuccessful after a prolonged trial. If no alteration in the symptoms occurs after two thorough infiltrations, further perseverance will prove ineffective. In two of the unsuccessful cases the shoulder disability was part of chronic generalized arthritic changes. In 16 cases a complete cure resulted from injections into the trapezius or, as seems more probable, the supraspinatus or levator anguli scapulae, which are situated directly beneath the trapezius. In many cases a single injection was successful; in those in which further injections were required a good prognostic sign was a decrease in the symptoms after the first injection, or a change in the character and distribution of the pain. Cases of shoulder disability can be differentiated from those presenting the picture of brachial neuritis. The foregoing observations are in line with recent researches on fibrositis, and emphasis is laid on the important part played by the trophic nervous reflex in its symptomatology.

Schweizerische medizinische Wochenschrift, Basel

72:57-84 (Jan. 17) 1942. **Partial Index**

Cases of Peptic Ulcer Surgically Treated in the Aarau Hospital Between 1925 and 1940. O. Häuptli.—p. 57.
Diagnosis and Therapy of Trigeminal Neuralgia. W. Ryffel.—p. 61.
Fixed Congenital Dextrolateral Position of Sigmoid. E. Ledergerber. —p. 64.
*Clinical Development and Bacteriologic Characteristics of Seven Cases of Meningococcic Meningitis. G. Déruaz and E. Novel.—p. 65.
Certain Aspects of Endocrine Interrelationships, Including Remarks on Niehans's Theory of Role of Endocrine Glands in Prostatic Cancer and Paraprostatic Hypertrophy. G. Brüstlein.—p. 70.
Simple Method of Demonstrating Small Quantities of Urobilinogen in Urine. F. Klein.—p. 73.

Meningococcic Meningitis.—Déruaz and Novel point out that the bacteriologic demonstration of the meningococcus and of its type is unimportant unless it aids in the confirmation of the clinical diagnosis and in the indication for serum treatment. Since the beginning of the era of serotherapy it has been true that recognition of meningococci of type A, B, C or D is helpful. This differentiation has not been nullified with the introduction of sulfonamide derivatives. Recently Armand and others have reported that sulfanilamide therapy proved to be highly effective in the presence of the type B meningococcus but that serotherapy was most successful in the presence of meningococcus A. The authors selected for study 7 cases of meningococcic meningitis in which culture permitted isolation of a stable type of meningococcus that would lend itself to laboratory investigations. The determination of the type of meningococcus cannot be made from the study of fermentation of sugars alone; it must be confirmed by serologic studies. Biochemical research revealed the variable individual characteristics of meningococci such as aberrant fermentations. In the authors' cases fermentation did not agree with type. Of seven strains of meningococci isolated, only two could be acclimated to simple gelose. Macroscopic agglutination readily permits the determination of the meningococcic types. In 1 of the cases the type B meningococcus was detected, while in the remaining 6 type A was present. No relationship existed between the bacterial type and the gravity of the disease. The mortality was related more to the late initiation of the treatment rather than to the type of meningococcus. Incubation, course and curability of the disease did not seem to be influenced by the type of the meningococcus present. Before the sulfonamide era meningococcic infections of type B were considered most grave. Armand-Delille points out the efficacy of sulfonamide derivatives in this type, particularly in nurslings. The authors' observations likewise emphasize the remarkable effects of these drugs in meningococcus A infections. Improvement in the cerebrospinal fluid after chemotherapy was very rapid. The clinical course depends more on the early initiation and the intensity of chemotherapy rather than on the type of meningococcus.

72:85-112 (Jan. 24) 1942. **Partial Index**

Diagnosis and Treatment of Trigeminal Neuralgia. W. Ryffel.—p. 85.
*Bronchitis Plastica. S. Seiler.—p. 86.
*Nephelometric Evaluation of Heat Denaturation of Proteins in Blood Serum as New Method of Examination: Clinical Significance and Comparison with Principles and Results of Takata-Ara Reaction. F. Wuhrmann and C. Wunderly.—p. 90.
Problem of Extrapleural Pneumothorax. W. Iff.—p. 94.
Automatic Apparatus for Monaldi Method of Endocavitary Aspiration. G. Rossel.—p. 96.
Present Status of Therapy of Cancer of Breast. R. Sarasin.—p. 97.
Treatment of Epilepsy. Stähli.—p. 100.
Classification of Pulmonary Tuberculosis: Draft for Practical New Nomenclature for Tuberculosis. S. Puder.—p. 102.

Bronchitis Plastica.—According to Seiler, bronchitis plastica is sometimes referred to as bronchitis fibrinosa, bronchitis pseudomembranosa, bronchitis crouposa and mucinosa. The chief characteristic of the condition is expectoration of coagulums formed within the bronchial lumen by exudates. The disorder is rare. The author reports that a woman aged 41 suffered at irregular intervals of from three to ten days bouts of fever which persist one to three days, accompanied by cough, dyspnea and expectoration of coagulums. After these had been expelled, the fever subsided. The recurrent bouts were accompanied by impairment of general health, tachycardia,

oppression, dyspnea and anxiety. Examination of the lungs revealed changes during the attacks and roentgenoscopy showed shadows in the right lower lobe that gave the impression of pneumonic foci. Tar preparations, potassium iodide, arsenic compounds and various expectorants were ineffective. Induction of pneumothorax was followed by two mild attacks of fever, after which the cough subsided and there was no further expectoration of coagulums. The pneumothorax was maintained and there were no attacks. The patient's general condition has greatly improved. Symptoms of the existing exophthalmic goiter were likewise favorably influenced. Artificial pneumothorax is to be recommended for cases of this type particularly when the disease process is localized, as may be evident from repeated roentgenoscopic examinations during attacks and intervals.

Heat Denaturation of Proteins in Blood Serum.—Wuhrmann and Wunderly point out that Weltmann's dilution series of calcium chloride solutions aims to determine the threshold value of flocculation as indicated by the dilution intensity of the serum proteins. In order to facilitate the characterization of the pathologic globular proteins, the authors added a new test tube to the Weltmann series. This tube contains only double distilled water. If blood serum in a 1 : 50 solution is cooked in this for fifteen minutes the serum proteins become denatured by heat. Whereas the solution intensity of normal serum prevents turbidity, an increase in isolabile globulins (euglobulin and pseudoglobulin I) cause cloudiness during dilution. After heating, the turbidity produced in this manner is sufficiently isodisperse to permit nephelometric evaluation. The technic of producing a nephelogram has been described previously by the authors. They demonstrate graphically the close relationship with Weltmann's coagulation band. Their new method detects changes in the blood proteins by determining the turbidity by means of the step photometer. The authors demonstrate the direct relations that exist between their method and the Takata-Ara reaction in Jezler's modification and discuss the protein chemistry that forms the basis of the two methods (increase in certain coarsely dispersed plasma proteins). The detected turbidity values are the higher the more strongly positive is the outcome of the simultaneously executed Takata-Ara reaction. If the absolute turbidity units exceed 0.0120 or 0.0125, a positive Jezler reaction can be counted on. Turbidity values between 0.0020 and 0.0120 indicate changes in the blood serum, which in consideration of the existing clinical condition cannot yet or can no longer be detected with the simultaneously executed Takata reaction. Their great clinical importance cannot be denied. The turbidity values are independent of the total protein, the bilirubin and the rest nitrogen values as well as of the outcome of the sedimentation test. The advantages of the new method are that the result can be read objectively in the step photometer, that it is completed in thirty minutes and that the quantity of serum required is only 0.1 cc.

72:113-140 (Jan. 31) 1942. **Partial Index**

Influence of Hypophysiodiencephalic System on Sexual Functions. A. Westman.—p. 113.
*Question of Immunity Reactions as Gage for Dosage of Sulfonamide Derivatives in Pneumonia. C. Maier and A. Grumbach.—p. 116.
*Thrombocytopenia Due to Sedormid Investigated on Basis of Sternal Puncture, Tolerance and Transfusion Tests. S. Moeschlin.—p. 119.
Management of Spontaneous Pelvic Presentation by Bracht Maneuver. W. Neuweiler.—p. 124.
Successful Surgical Treatment of Funnel Chest. F. Häberlin.—p. 126.
Acute Gangrenous Perforative Appendicitis and Its Therapy. O. Baumgartner.—p. 128.

Immunity Reactions and Sulfonamide Dosage in Pneumonia.—Maier and Grumbach point out that the discovery of the sulfonamides has not diminished the importance of immunobiologic processes but has given it a new direction. Certain investigators have denied that sulfonamide therapy influences the time of appearance of antibodies, while others have noted considerable differences in their appearance after sulfapyridine and after sulfathiazole. It appeared that only one fourth of the patients treated with sulfapyridine had a positive precipitin reaction, whereas three fourths of those treated with sulfathiazole gave positive reactions. This appears contradictory in view of the fact that fever disappears more rapidly under the influence of sulfapyridine than under that of sulfathiazole. American investigators made daily tests of the agglutination values in 200 cases of pneumonia with the aim of determining the time when chemotherapy could be discontinued without the hazard of a relapse. There were many cases in which no agglutinins became demonstrable in spite of a favorable effect. They regarded this as "abnormal." Maier and Grumbach point out that the explanation is not necessarily to be found in the immunobiologic sphere. Munzinger has observed at the Hygiene Institute in Zurich that only for 99 of 209 typical pneumococci could corresponding agglutinins be found in the serum. In these tests not the missing agglutinin formation was stressed but rather the possibility that in an undetermined but considerable percentage "false," that is, epiphytic, pneumococci were found which had no connection with the disease. The authors stress this possibility and think that the time of appearance of the agglutinins and the prognostic evaluation based on it must be accepted with reservation. They determined the agglutinin content of patients with pneumonia against the homologous type of pneumococcus as well as against types 1, 2 and 3 pneumococci. Their results corroborated their former opinion that this is only one phase of the immunity. The clinical course and, in particular, the complications are unrelated to the appearance of the agglutinins. Determination of their appearance is therefore of no value for the prognosis or the chemotherapeutic management. For the present, estimation of immunity in pneumonia must be based chiefly on the temperature curve, the leukocyte studies and the general condition of the patient. Because of the tendency to relapses during the first seven days of pneumonia, chemotherapy should be continued for an adequate length of time.

Thrombopenia Due to Sedormid.—Moeschlin points out that the acute thrombocytopenia occasionally caused by sedormid (allyl-isopropyl-acetyl-carbamide) is a typical disturbance of the platelet apparatus, the study of which may throw light on the essential nature of anaphylactic thrombocytopenias as well as on the entire mechanism of the platelet regulation. Some authors consider an isolated impairment of the megakaryocytic apparatus of the bone marrow responsible for this type of thrombocytopenia, whereas others regard increased destruction (thrombocytolysis) responsible. The author attempted to clarify this problem by studies of sternal punctates and by controlling the decrease and subsequent increase in platelets during experimental tolerance tests with the aforementioned hypnotic. He describes observations in 10 cases. Observations of the megakaryocytes in sternal punctates during acute thrombocytopenia and during its later course disclosed no definitely pathologic changes. A slight deviation to the left developed in the megakaryocytic series of the bone marrow immediately after the development of acute thrombocytopenia. The myelogram remained practically unchanged, except for a mild increase in erythroblasts as a sequel of hemorrhages. Two or three days after the acute thrombocytopenia a noticeable and a progressive increase in blood platelets became apparent, and after from five to seven days normal values were reestablished. At first, pathologic and large forms were often seen. They were interpreted as the result of inhibited maturation of the megakaryocytes. The exact control of the decrease in thrombocytes during the tolerance test reveals a rapid disappearance of thrombocytes in particularly sensitive persons as early as from thirty to sixty minutes. This indicates that, in addition to the impairment of platelet production in the bone marrow, the thrombocytes likewise disappear from the blood. Two blood transfusions in which a person sensitive to sedormid served as donor were carried out at the height of a thrombocytopenia; they produced in the recipient no decrease in the thrombocyte values. This seems to indicate that the blood contains no platelet lysin during acute sedormid thrombocytopenia. It proved impossible to transfer the hypersensitivity passively by transfusion to the recipient. The author concludes that in hypersensitive patients sedormid produces an impairment of the thrombocytes in the circulating blood and that in addition the maturation of the megakaryocytes in the bone marrow is temporarily inhibited. The hypersensitivity toward such substances is probably not of peripheral but of central origin, resulting from a sensitization of certain nervous centers that regulate the entire platelet apparatus.

Revista Médica de Chile, Santiago

70:251-328 (April) 1942. **Partial Index**

Epidemiology of Typhoid in Chile. J. Donoso Donoso.—p. 251.
Sanitary Problem of Oysters. J. Caballero Geisse.—p. 260.
*Takata-Ara Reaction in Hepatobiliary Diseases. H. Alessandri and H. Ducci.—p. 263.

Takata-Ara Reaction in Hepatobiliary Diseases.—Alessandri and Ducci report their experiences with the Takata-Ara reaction in 166 cases. They used the technic suggested by Wayburn and Cherry in 1938. The test was made in various types of jaundice, icterogenic cirrhosis, cirrhosis without icterus, hepatic cancer and other disorders that may be confused with hepatic cirrhosis. They conclude that: 1. The technic of the Takata-Ara reaction is simple but one must be thoroughly familiar with it in order to interpret it correctly. 2. The test is of no value in the diagnosis of hepatobiliary diseases, because a high percentage of positive results are obtained in the absence of involvement of the liver or of the biliary passages. 3. It does not aid in the differential diagnosis of the different types of jaundice, because in the obstructive form, as well as in the hepatocellular forms, positive results are obtained in approximately the same proportion of cases. 4. Although the reaction is positive in about 100 per cent of the cases of cirrhosis with a complete clinical picture, the percentage is considerably lower in the incipient and the moderately advanced cases. 5. Results obtained with the reaction do not permit a differential diagnosis between hepatic cirrhosis and other disorders that may be confused with it, such as cardiac liver, fatty liver and hepatic cancer, because in these conditions there is likewise a high percentage of positive reactions. 6. The only clinical value of the test is that it makes the diagnosis of hepatic cirrhosis doubtful when the reaction is negative in the presence of a fully developed clinical picture.

Revista Médica de Rosario, Rosario de Santa Fe

32:77-130 (Feb.) 1942. **Partial Index**

*Action of Sulfanilamide on Female Genital Apparatus. L. A. Belizán.—p. 77.

Action of Sulfanilamide on Female Genitalia.—Belizán injected subcutaneously into female rats and rabbits sulfanilamide in doses of 0.2 to 0.5 Gm. for each kilogram of body weight. The injections were administered every twelve hours for several days and were followed by periods of rest of several days and by a new series of injections. The estrous cycle, ovulation, sensibility of castrated animals to estrogens, course of pregnancy and histologic characteristics of the ovary and the uterus were not modified by the sulfanilamide.

32:201-280 (April) 1942

*Acute Leukemia. J. P. Picena.—p. 201.
Case of Multiple Myelomas or Kahler's Disease. R. Tisserandet.—p. 221.
Experimental and Practical Foundation of Local Sulfonamide Therapy in Surgery. J. Nasio.—p. 236.

Acute Leukemia.—Picena believes that acute leukemia is more common than the chronic type. He reviews 59 cases, in 55 of which complete data were available. He states three factors responsible for its not being diagnosed more frequently: (1) The disease presents itself in an atypical form; (2) it may exhibit an aleukemic or a leukopenic hematic formula; (3) laboratory errors occur, particularly with regard to the microhemocytoblasts. The classic symptomatology of acute leukemia as described in the standard treatises is encountered in only 1 case out of 5. To the practitioner the term acute leukemia suggests splenomegaly and an abnormal hematologic formula with high counts of undifferentiated cells. These phenomena quite often are not present. The author derives a concept from his observations that the only constant clinical syndrome is the least pathognomonic of all; namely, anemia and fever. He postulates that in a case of anemia and fever, when these symptoms cannot be explained by an infection or other disorder, it is necessary to make a complete hematologic examination, including a medullary biopsy, if the hemogram does not clarify the picture. It is impossible to make a prognosis on the basis of the leukocytic formula as suggested by Ferrata. The acute leukemias of the monocytic type most constantly exhibit the complete clinical picture regarded as classic. The author stresses the diagnostic difficulty presented by the microhemocytoblast and adds some differential morphologic details. The prognosis is unfavorable in a comparatively short time. In over 70 per cent of the cases death follows within less than three months after the initial symptoms.

Münchener medizinische Wochenschrift, Munich

88:1101-1124 (Oct. 10) 1941

Copper a New Therapeutic Against Chronic and Subacute Arthritis. E. Fenz.—p. 1101.
*Cranial Osteomyelitis Resulting from Sinusitis. H. Markus.—p. 1105.
Late Disorder After Brain Injury: Case. Poeverlein.—p. 1108.
Possibilities of Surgical Treatment in Disorders of Glands of Internal Secretion. H. Junghanns.—p. 1110.
Storage of Sterilized Syringes by Practitioner. H. Thorer.—p. 1113.

Cranial Osteomyelitis Resulting from Sinusitis.—Markus reports a case of cranial osteomyelitis which originated in a bilateral suppurating sinusitis with polyp formation. The process first attacked the frontal bone but subsequently involved all the bones of the cranial vault. It brought on severe suppuration and sequestration and progressed slowly but constantly. The peculiar structure and course of the diploic veins and the lack of gelatin producing and fibril forming tissues in the cranial bones facilitates this spreading beyond the bone sutures. The extremely chronic course was noteworthy in the case described. Death resulted from a meningitis originating in a petrosal focus. The early and radical removal of the involved bone, without consideration of the cosmetic effect, is the only treatment that will reduce the high mortality of cranial osteomyelitis.

Acta Chirurgica Scandinavica, Stockholm

86:1-202 (Jan. 19) 1942. **Partial Index**

Varicocele. J. Spotoft.—p. 1.
Rupture of Kidney Treated by Partial Resection: Significance of Roentgenologic Examination for Treatment. G. Brante.—p. 37.
*Problem of Wound Healing in Compound Fractures of Long Tubular Bones. E. Moberg.—p. 43.
Sterilization with Formaldehyde in Vacuum and Resistance of Elastic Rubber Catheters. K. S. Jørgensen.—p. 67.
Ability of Bone Tissue to Survive in Pedicled Bone Grafts. A. Hellstadius.—p. 85.
High "Late Ruptures" of Tendon of Extensor Pollicis Longus. S. von Stapelmohr.—p. 110.
Treatment of Acute Blood Loss That Threatens Life. A. W. J. H. Hoitink.—p. 129.
Benign Lymphogranulomatosis: Case with Mammary Alterations as Only Symptom. G. Dalmark.—p. 168.

Wound Healing in Compound Fractures of Long Bones.—Moberg reports observations on fresh compound fractures of the long tubular bones observed at the Surgical Clinic of the University of Lund during the years between 1926 and 1935. The material comprises 175 cases. Primary healing was obtained in 109 cases, or in 62 per cent. Superficial suppuration or necrosis without impairment of the healing of the fracture was observed in 24 cases (14 per cent). In 32 (18 per cent) osteitis developed, in 10 (6 per cent) gas gangrene. The author analyzes the material with consideration of the factors known to influence the healing process: the time elapsed between injury and wound treatment, the size of the wound, the degree of contamination, the type of trauma (motor vehicle accidents) and the age of the patient. The following points are stressed: 1. The size of the wound is of dominating influence. The prognosis is considerably more unfavorable in the presence of severe lacerations. Wounds caused by perforation of skeletal parts from the inside usually heal by primary intention. 2. Fractures with severe wounds that occur in agricultural workers or in diggers or excavators result in wound infections about twice as often as do open fractures sustained in other surroundings. All 10 cases of gas gangrene concerned agricultural workers or related occupations. 3. Wounds contaminated with hay or straw heal only exceptionally by first intention. 4. The time that elapses between injury and onset of treatment has no appreciable influence on the process, as long as it is not longer than four hours.

Book Notices

Diagnostic Roentgenology. Ross Golden, M.D., Editor, Professor of Radiology, the College of Physicians and Surgeons, Columbia University, New York. Renewal pages for Volumes I and II. Loose-leaf. Price, $25 per set of two volumes. Pp. 600+, with illustrations. New York & Edinburgh: Thomas Nelson & Sons, 1941.

This represents a complete revision of the material on the skull and intracranial contents. The development of the skull, the essentially important roentgen-anatomic points and normal markings including physiologic intracranial calcification are treated briefly. The section on neoplastic disease is impressive. The section on encephalography and ventriculography mirrors the familiarity with the subject expected of one whose excellent contributions to the literature are so numerous. The author carefully assigns space to the technic of encephalography and ventriculography. Cerebral arteriography is considered and the difficulties arising from the method employing diodrast. The dangers arising from thorium dioxide and iodized oil ventriculography are clearly stressed.

The material on radiology of the chest by Coleman B. Rabin is an excellent review of the literature which brings the subject matter on the chest and its component parts up to date. Of special interest are the sections on cystic disease of the lung, pneumonoconiosis, apical empyema, movements, hernia and neoplasms of the mediastinum, diaphragmatic movement and so-called basal stripes. A new and extremely important section on the differential diagnosis of certain roentgen shadows covers the variations of the pulmonary markings as found in pulmonary and cardiac lesions, the difficulties of differential interpretation of various types of shadows confusing normal anatomic structures, extraneous factors and extrapulmonary lesions as well as typical intrapulmonary shadows. A third part of this section covers the interpretation of roentgenographc artefacts, something the lay practitioner is prone to forget.

Use of the roentgen ray in obstetrics is by Howard C. Moloy and Paul C. Swenson. Recognition is given Snow and Rosensohn's and Brown and Heppel's work on soft tissue radiography in pregnancy, which can furnish such important information regarding the position of the placenta, the possibility of placenta previa, especially when used in conjunction with injection of opaque material (Ude and Urner) or air (Snow) into the urinary bladder, extrauterine pregnancy, tumors and premature separation of the placenta. The authors again stress the importance of understanding and evaluating the principles underlying the various methods of pelvimetry in order to avoid miscalculations and inaccuracies arising from technical irregularities. Mention is made of Ganzow's idea of inserting an opaque sacral marker, graduated in centimeters, close to the sacrum between the buttocks so that on projection the distortion factor is the same as that of all the diameters of the medial sagittal plane. In their analysis of the lateral film of the pelvis, the authors ably indicate the importance of visually or graphically dividing the pelvic canal into four planes and drawing a perpendicular through these planes through the posterior aspect of the ischial spines in order to determine the degree of lower sacral encroachment, the amount of available space behind and below the spines and the optimal position the head should assume for delivery through the outlet. A summary and brief analysis of pure and mixed pelvic types are included. The conclusions are interesting as pointing to the importance of experienced interpretation of fetal-pelvic relationships and the adaptation of the mechanism of delivery to the pelvic form where previously so much stress had been placed on accurate measurements of the pelvis.

The chapter on body section radiography by Sherwood Moore is comprehensive yet succinct. Although replete with indistinct illustrations, it indicates the possibilities of this newer adjunctive radiographic procedure, for which Dr. Moore has been such an able and persistent proponent. With further and continued improvement in quality and accuracy, the method may yet allow the roentgenologist to view a plane section of an anatomic part much as a pathologist views a plane section of a brain. Consideration is given chronologic historical development as well as terminology, which because of the large number of independent investigators has resulted in a confusing number of descriptive names.

Angiography is covered by John D. Camp and Edgar V. Allen. With this procedure few roentgenologists are thoroughly familiar. Four opaque materials—skiodan, diodrast, thorotrast and ethyl-tri-iodostearate are considered as to opacity, toxicity and the part to be roentgenographed. Perhaps the stress laid on toxic effect will make roentgenologists overcautious and hesitant about using the materials available. Cerebral arteriography still carries too much risk to lend itself to general application, and, since other methods of diagnosis are available, such as encephalography and ventriculography, its use is limited to few selected cases. Venography, technics of injection, clinical use, interpretation and illustration of various types of pathologic changes are discussed. A separate section, covering visualization of the heart and great vessels, describes Robb's and Steinberg's methods, giving technic, reactions and interpretation. The more recent development, by Sussman, of a wheel-like arrangement permitting numerous exposures so as to demonstrate particularly desired chambers probably illustrates the main difficulty of the method, namely the inability, with more commonly used equipment, to obtain a film at precisely the moment the particular chamber is filled.

The section on the roentgen diagnosis of fractures and dislocations by L. Henry Garland includes definitions, classification, diagnosis, differential diagnosis, regional diagnosis, union and nonunion, late traumatic lesions of bone and dislocations. Traumatic lesions of the spine have been of increasing frequency since the development of cheap, individualized high speed transportation. Fractures of the body of the vertebra may be transverse, vertical or marginal. The roentgen findings may consist of a linear area of increased or decreased density, increased when there is a little impaction or compression and decreased when there is a little separation. The fracture line is usually most evident in the anterior part of the body and is best seen in the lateral projection. It is frequently associated with vertical narrowing or compression, the compression being usually most evident anteriorly but sometimes laterally. Fractures of the transverse processes, especially of the lumbar area, are indicated by the presence of an irregular linear area of rarefaction extending vertically through the process. Their visualization may require the highest quality of stereoscopic anteroposterior roentgenograms. Fractures of the articular processes manifest themselves as irregular linear areas of rarefaction extending transversely or obliquely across the processes. They are usually associated with fractures elsewhere in the vertebra. Their detection may require oblique (30 to 60 degree) stereoscopic projections of the spine. They must be distinguished from congenital persistent separate epiphyses, frequently seen at the tips of the inferior articular processes in the lumbar region, and from overlying bony margin shadows, which, when the bony margin is irregular and sclerotic, may easily simulate fracture. Multiple projections, careful stereoscopic oblique projections and occasionally laminagraphic (planigraphic) projections may be required in special cases. Fractures of the upper cervical spine are frequently difficult to diagnose, especially when the patient carries a full set of teeth and cannot or will not open the mouth wide enough to permit satisfactory stereoscopic anteroposterior projections to be made.

Soft tissue roentgenography is discussed by James R. Lingley and William J. Elliott. This section describes the technic of roentgenographic visualization of soft tissue pathologic changes such as edema, inflammation, hemorrhage, muscular atrophy, gas in the soft tissues, arteries and veins, calcification and ossification in the soft tissues and dystrophic calcification. Continuous improvement in the design and operation of x-ray equipment is opening an increasingly wider field for the roentgenologist in the demonstration of pathologic conditions of the soft tissues. Although the differences in absorption of radiation by the various soft tissues of the body are much less than those of the skeletal system, if proper technic is employed suf-

ficient differentiation is possible to render such study of considerable diagnostic value. Visualization of any structure in the body is possible only if it absorbs more radiation than the surrounding muscles. A gas bubble in the stomach is visible because it absorbs less radiation than the surrounding tissues. Among these substances, bone cortex and fat show the widest variation in absorption and, therefore, the greatest contrast on the roentgenogram.

Tissue densities, arranged in the order of decreasing absorption of radiation, which may be detected on the roentgenogram are (1) tooth enamel, (2) bone cortex, calcification, (3) a large group consisting of most of the soft tissue, muscular, nerve and parenchymatous tissue, water, body fluids, (4) adipose tissue and (5) gas.

The roentgenographic diagnosis of diseases of the skull and intracranial contents is elucidated by Cornelius G. Dyke. The roentgenologic criteria for the diagnosis and treatment of cranial and intracranial lesions are set forth as briefly as is commensurate with accuracy. This section discusses congenital anomalies and traumatic disorders of the skull, blood vessels, meninges and brain substance. Under neoplastic diseases the author discusses evidences of tumor, consideration of specific tumors, infectious diseases, nutritional diseases and miscellaneous diseases. Encephalography and ventriculography are discussed from the points of view of technic, congenital anomalies, traumatic disorders, infectious diseases and neoplastic diseases. Roentgenotherapy is discussed in detail.

Surgical Physiology. By Joseph Nash, M.D., Assistant Professor of Clinical Surgery, New York University College of Medicine, New York. Cloth. Price, $6. Pp. 496, with 16 illustrations. Springfield, Illinois & Baltimore: Charles C Thomas, Publisher, 1942.

This is an accurate and excellently written book and deserves wide circulation among all those desiring to keep abreast of modern developments in physiology. While designed primarily for surgeons, it should prove equally valuable to clinicians in other fields. The chapters on circulation and respiration present the fundamentals simply and clearly, and the clinical applications are well chosen. There is an excellent picture of the blood and vascular changes in shock and burns. The section on the alimentary system should also prove most useful. There is a thorough discussion of water and salt balance and the significance of the loss of gastrointestinal secretions in various pathologic states. The section on the endocrine glands presents an intelligible statement of present views in a field that is expanding too rapidly for any but the specialist to follow. The book concludes with an excellent discussion of the physiology of the nervous system. The printing and binding are well done, and the absence of glare is especially pleasing to the eye.

Time and the Physician: The Autobiography of Lewellys F. Barker. Cloth. Price, $3.50. Pp. 350, with 7 illustrations. New York: G. P. Putnam's Sons, 1942.

At the age of 75 the author reviews his life and work from the beginning in a small Canadian community to emeritus professor in Johns Hopkins University and retired physician in Baltimore. After his medical course at the University of Toronto he worked with Osler, Welch and Mall at Hopkins until 1900, when he went to the University of Chicago, returning in 1905 to Hopkins as Osler's successor as head of the department of medicine. In the meantime he made important contributions to the study of anatomy and served as member of a medical commission to the Philippines in 1899, when he also visited plague stricken districts in India and China. In 1901 he served on a federal commission on plague in San Francisco.

With Franklin P. Mall, the anatomist, Barker advocated full time appointments in clinical branches, which went into effect in the Hospital of the Rockefeller Institute for Medical Research in 1909 and at Hopkins in 1913. Barker gives a detailed account of the considerations that led to his refusal of the full time appointment in medicine at Hopkins, where he continued as clinical professor until he became emeritus in 1921. He enjoyed an expanding private and consulting practice on a modified group plan until his retirement.

"Time and the Physician" is a calm, candid, well told story of a physician of many parts and large achievements. It is a valuable addition to medical autobiography. For former students, associates and friends the book holds special enjoyments and charm. The light it throws on the developments in modern American medicine, scientific as well as practical, will interest wider circles. The medical historian of the future will find the book an important source of information about the period it represents.

The Principles and Practice of Beauty Culture. By Florence E. Wall, A.M., F.A.I.C., Lecturer on Cosmetology, School of Education, New York University, New York. Cloth. Price, $6. Pp. 708, with 183 illustrations. New York: Keystone Publications, 1941.

The author lectures on cosmetology at the School of Education of New York University. The rise of the cosmetic industry in the United States is one of the strange sociologic and economic phenomena of our generation. Modern cosmetology includes considerations of physiology, bacteriology, anatomy, chemistry, physical therapy and other basic sciences. The applications concern particularly care of the hair and scalp, the hands and feet, and the business aspects of the management of a beauty shop or beauty culture institute. Every one of these phases is considered in this general volume by Florence Wall, whose experience as a practitioner and teacher makes her especially competent in the field. She has, furthermore, investigated for many years the new technics and devices that have been developed from time to time. Her book of questions before examining boards is well known to the cosmetic profession. That work is keyed to the present textbook. Her volume is supplemented by a bibliography which indicates wide reading and by an excellent index. Useful also is an outline of first aid in the beauty shop, which indicates that the most frequent types of injury are cuts, burns, electric shock, fainting, heat exhaustion, foreign bodies in the eyes and nosebleed.

Handbook of Health for Overseas Service. By George Cheever Shattuck. Prepared for the Coordinator of Information [now known as Office of Strategic Services], Washington, D. C. With contributions by other authors. Adapted from "Handbook of Travel," second edition. Cloth. Gratis. Pp. 198, with 14 illustrations. Cambridge: Harvard University Press, 1942.

As an aid to nonmedical men who go on field service singly or in small groups in areas where medical advice is not available, the Office of the Coordinator of Information has prepared a special edition of the Handbook of Health for Overseas Service by George Cheever Shattuck with contributions by others. Dr. William J. Mixter prepared the chapters on surgery and on first aid, which was adapted from the Handbook of First Aid of the United States Office of Civilian Defense. The section on snakebite is by Dr. Thomas Barbour, and the chapter on the arctic is by the late Dr. Howe and by Major Burwash. The book is written in simple language and is exceedingly practical. It provides information for many types of emergencies and particularly concerning common ailments. There is a brief statement on personal hygiene. A supplement discusses use of the simplest medical instruments and of ordinary drugs such as might be available in a medicine chest. Certainly a small handbook of this type would be a great aid and comfort to an expedition of the type described.

Science and Man. Twenty-Four Original Essays by Various Authors. Edited with an introduction and conclusion by Ruth Nanda Anshen. Cloth. Price, $4. Pp. 494. New York: Harcourt, Brace & Company, 1942.

This work includes twenty-four important essays on science in relationship to modern life, divided according to such classifications as science and the universe, science and society, and science and the individual. Obviously the work is a glorification of the contribution of science to modern life. It is pointed out, however, that science may be turned against morals and against humanity as indeed it already has been turned by the Axis in this war. Each of the essays here included is thought provoking. As a whole they give a survey of what science has contributed to modern civilization not likely to be found so well and so authoritatively presented in any other similar collection.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

TREATMENT OF POISON GAS BURNS OF EYE

To the Editor:—**Could a 2 per cent aqueous solution of butyn, a 1:500 aqueous solution of nupercaine or a 1 per cent aqueous solution of holocaine hydrochloride be substituted for pontocaine in the eye for the treatment of mustard gas injury? I have noted in a release of the Office of Civilian Defense instructions for using hydrogen peroxide in the eyes after mustard gas or lewisite, followed by the additional statement that potassium permanganate could be used in the eye in a 0.5 per cent solution. I never had occasion to use permanganate in the eyes, and this seems to me to be strong, and, unless this strength is confirmed, I would hesitate to use it.**

Neal Naramore Wood, M.D., Mackinac Island, Mich.

ANSWER.—All local anesthetics inhibit the respiration of the corneal epithelium and delay its regeneration. Therefore it is unwise to use them excessively in the treatment of mustard gas injuries to the eyes. If necessary for examination or treatment of the patient, one instillation of any of the anesthetics mentioned may be used.

The use of hydrogen peroxide or potassium permanganate solutions is no longer recommended for the treatment of mustard gas or lewisite burns of the eye. One instillation of 2 drops of either 0.5 per cent hydrogen peroxide or 0.5 per cent potassium permanganate will not damage the eye, but these concentrations are ineffective in the treatment of ocular burns with these vesicants. A 2 per cent solution of hydrogen peroxide can seriously damage the eye, especially if the corneal epithelium is abraded or if irrigations are continued for more than one minute. At present the most effective emergency treatment of mustard and lewisite burns of the eye consists in immediate copious lavage with water, 1.5 per cent sodium bicarbonate, 0.9 per cent saline solution or 2 per cent boric acid solution.

INTRAVENOUSLY ADMINISTERED TYPHOID VACCINE FOR FEBRILE REACTION

To the Editor:—**Have fatalities been reported from the intravenous use of triple typhoid vaccine to induce fever? What are the risks involved in its repeated use at intervals of one to three days, in nondebilitated subjects? My experience has favored the intravenous use of Coley's fluid 0.01 cc. or less as the initial dose. Is there evidence that triple typhoid vaccine is definitely the best agent to induce fever by injection?**

M.D., U. S. N. R.

ANSWER.—The induction of febrile reactions to intravenous injections of triple typhoid vaccine is essentially quite a safe procedure. Thousands of patients have received this treatment with no untoward reactions. But unusual reactions do occur occasionally and have included acute and subacute appendicitis, cholecystitis, enteritis, pleurisy, pericarditis, iritis, glaucoma, adenitis, extensive vascular thrombosis and renal insufficiency. These reactions can be classified under four headings: (1) stimulation of inflammatory foci of infectious origin, (2) stimulation of inflammatory foci of noninfectious origin, (3) stimulation of latent diathetic phenomena and (4) stimulation of vascular reactions producing acute thrombosis or vasomotor imbalance. The incidence of such untoward reactions has been estimated by Hench (*Arch. Int. Med.* **49**:1 [Jan.] 1932) as being about 0.2 per cent of injections and about 0.5 per cent of patients so treated.

A fatal reaction may occur rarely. Hench reported three deaths following reactions to typhoid vaccine given as foreign protein therapy. In a case in which a patient aged 52 years was suffering from occlusive vascular disease of the extremities, thromboses of the iliac arteries and anuria developed after one injection (50,000,000 bacilli). A second patient, aged 51 years, who was suffering from rheumatoid arthritis, had fatal anuria after one injection (25,000,000 bacilli). After a third patient, aged 38 years, suffering from rheumatoid arthritis, had received one injection (50,000,000 bacilli), acute nephritis with anuria developed. From the literature Hench collected reports of nine deaths following injections, not of typhoid vaccine, but of various other substances used as foreign proteins. The patients involved had pneumonia, typhoid or various types of arthritis, and death presumably resulted from thrombosis of a renal artery with anuria, vasomotor collapse with uremia, thrombosis of iliac veins, hemorrhage of the brain or "anaphylaxis."

Chief contraindications to such treatment are severe peripheral or renal arteriosclerosis, uncompensated cardiac or vasomotor disease, chronic infections of long duration with dissemination to several sites, states of exhaustion following prolonged illness, active or quiescent pulmonary tuberculosis, conditions in which hemorrhage may occur as in persons suffering from hemophilia or in other "bleeders," chronic alcoholism, states of grave nervous instability, diabetic acidosis, definite protein hypersensitivity suggested by a history of serum sickness, urticaria or angioneurotic edema, and rheumatic fever with acute or decompensated carditis.

Febrile reactions to typhoid vaccine are used most commonly for patients suffering from rheumatoid arthritis; unless these patients are more than 50 years of age or are greatly debilitated they tolerate the treatments quite well, but they may or may not receive significant relief. The majority of such patients do not receive much relief; in a few cases remissions of significant length or satisfactory ameliorations of pain do occur. There is some evidence to suggest that the response of such patients to fever induced by injections of typhoid vaccine and to that induced by machines is not identical. Some patients who have had both types of febrile reactions have claimed more relief with one form, others with the other. In one small series studied (unreported) the majority of patients preferred reactions induced by typhoid vaccine. They included some claustrophobic patients who objected to being "locked up in a fever cabinet."

FRAGILITAS OSSIUM

To the Editor:—**A baby had a cranium so soft that it easily could have been crushed between the hands; for the first two weeks of his life, he was not handled, just rolled on a towel. He was fed by a medicine dropper and given calcium lactate. He responded nicely and walked at 10 months. The fontanels closed in fifteen months. During the first five years of his life he was active but very nervous, sweating easily on slight exertion, and he had a fine tremor. He was given thyroid, which relieved that. Since then his skin, especially on the legs and arms, has presented "goose flesh" or cutis anserina: the hair follicles are elevated, feel hard and tense, and, when picked out, look like milia. The palms and soles are hard and dry. In his ninth year his school work is satisfactory; he is a little above the average in intelligence. He has developed into a good looking boy with beautiful straight legs. He is 54½ inches tall and seems well but is rather restless. What is the diagnosis and therapy? I will greatly appreciate your advice.**

M.D., Missouri.

ANSWER.—If this was really a patient with fragilitas ossium, which may be assumed from the description of the skull, it has been an extremely fortunate experience because usually such babies have multiple fractures all over the body and are hard to raise. Such babies are supposed to have blue scleras. Is this true of this patient?

The present condition of the skin has no relationship to fragilitas ossium. With the story given of previous thyroid insufficiency, however, it is likely that more thyroid would relieve the condition described. Many hypothyroid patients with this rough skin are helped by the administration of thyroid.

The two conditions do not necessarily go together. It is interesting to speculate as to whether thyroid secretion has anything to do with primary bone disease, but such a relationship is not commonly spoken of.

CORONARY ARTERY DISEASE AND ACUTE SINUSITIS

To the Editor:—**In a case of angina of effort and coronary artery disease, what is the safest decongestant to be employed in the nose for an attack of acute sinusitis?**

M.D., Pennsylvania.

ANSWER.—The information given limits us to a consideration of the dry congestive stage of an acute head cold, and that is probably what was meant by the term of "attack of acute sinusitis."

Several prominent cardiologists are of the opinion that such decongestants as ephedrine and epinephrine-like substances, even cocaine hydrochloride, when used moderately in low strengths not too often, are not contraindicated in cases of angina of effort and coronary artery disease. It may well be, however, that one of these decongestants may produce pain, in which event it should be promptly stopped and never used again. Thus a certain amount of trial and error method might have to be used in given cases.

Whatever decongestant is used there is apt to develop some stimulation of the sympathetic system with resultant constriction of the coronary artery. Some cardiologists are not fully in accord with this, however.

It is of the utmost importance to keep the patient's nasal airway free and clear; otherwise there may develop faults in efficient oxygenation as well as certain reflex disturbances.

Watery salts are absorbed faster than oily solutions. The rhinologic consensus today is for the use of ephedrine sulfate

0.5 to 2 per cent in an isotonic solution of sodium chloride to be used as nose drops or spray. Such an official preparation or a similar approved decongestant, either in isotonic sodium chloride or isotonic dextrose drops or spray is safe and should be tried. Such solutions stimulate the cilia and produce no harm in the function of the intranasal mucous membrane.

Oily solutions have a tendency to reduce the speed of ciliary action and hence are not so strongly emphasized at the present time, in the light of the newer physiology of the nose and its membrane, as well as the recent reports of lipid pneumonia.

These solutions are not absorbed as rapidly as watery salts, so that systemic effects are less likely to be encountered.

Because this patient has angina of effort and coronary artery disease it might be best to use a 0.5 to 1 per cent ephedrine alkaloid in light liquid petrolatum, to be used as a fine spray to decongest the engorged nasal mucous membrane during the dry congestive stage of the head cold.

Care must be taken that this solution is fresh; therefore, be sure that the pharmacist has fresh preparations and prescribe only a small quantity at intervals.

If the oily preparation does not produce good results, try sprays of 0.5 to 2 per cent ephedrine sulfate in isotonic solution of sodium chloride.

It is important to emphasize once again that the nose should be kept open and the airway free and clear.

HYSTERICAL OCULAR SYMPTOM

To the Editor:—**A white man aged 44, a grocery clerk, presents a negative family history except for bronchial asthma. He had the usual childhood diseases, has had influenza every winter, has sore throat often and has had diminished hearing for the past two years. His present complaints began four years ago. About once a week he gets a spell of rolling his eyeballs upward and to the right, and his head turns to the same side with the face turned upward. This condition lasts from a few minutes to a half hour and cannot be produced voluntarily. The spells come on more readily if he stoops a lot or if he is greatly excited. Relief is obtained by lying down and shutting his eyes, whereupon a clonic blepharospasm appears. When the eyelids are opened the eyes look straight but gradually roll upward to the former position. He complains of blurring vision during the spells and cannot see below the level of his head. He feels the oncoming spell by a heavy pressure in the eyeballs a half hour before. His mind is not dimmed during the spells. The eye specialist could not find anything wrong, and several practitioners treated him for his nervous disease without success. He uses neither alcohol nor nicotine. His eyes show a normal appearance and pupils react to light and accommodation fairly well. During the spell, convergent strabismus is noted. There is no adenopathy nor tenderness over nerve points. The heart is within normal borders, and no murmurs are heard. Reflexes are increased. Kahn test is negative. I would appreciate your advice on this case.**

M.D., Mount Zion, Ill.

ANSWER.—This sounds like a purely hysterical manifestation and corresponds closely to the description given by Uhthoff and by Wildbrand-Saenger. A rather extensive discussion of similar phenomena can be found in the sixth volume of the Kurzes Handbuch der Ophthalmalogie, published by Schieck & Brückner. An examination by a psychiatrist or a psychoanalyst would seem to be indicated.

CARE OF FINE HAIR

To the Editor:—**A woman patient whose hair is soft and silky has much difficulty with coiffures. Is there any evidence that vitamin therapy has any effect on the hair or is there, to your knowledge, some safe external preparation which may be used?**

M.D., Ohio.

ANSWER.—There is no evidence that vitamins have any effect on the texture of the hair.

The hair should be shampooed at weekly intervals with one of the so-called soapless shampoos, of which sulfated olive oil may be regarded as the best. In addition to their excellent detergent qualities, these shampoos also have a good lubricating value. The latter may be enhanced by adding liquid petrolatum in various proportions, depending on how dry the hair is. The addition of liquid petrolatum does not materially decrease the cleansing action.

If ordinary shampoos are used, the hardness of the water should be ascertained and a suitable water softener added before washing the hair. Information on this point may usually be obtained from the local health department. In hard water, soap will form insoluble salts, which cannot be washed out of the hair. As a result the hair becomes dull and brittle and cannot be set properly. Acid rinses after the shampoo are often recommended but useless.

Care should be taken regarding permanent waving, especially with fine silky hair. A preliminary "test curl" will permit the proper regulation of the heat. Too frequent permanent waving will render the hair excessively dry and difficult to dress.

Massaging the scalp with olive oil a few times weekly may also be of advantage.

TETANY OR HYSTERIA?

To the Editor:—**A woman aged 23 was delivered by cesarean section of a premature infant three months ago. She made an uneventful recovery, and the baby remained in the hospital. Her breast milk was brought to the hospital to feed the baby, and it was found that she was producing so much milk that there was plenty to feed another infant. On February 21 the baby was brought home, and on that day suddenly the mother experienced a severe pain in the back of the neck and back, causing opisthotonos, abdominal cramps, generalized aching and headache. A diagnosis of calcium deficiency was made, and calcium chloride was given in the vein with almost immediate results. The breasts dried up and the baby was put on the bottle. However, her spasms continued and soon the patient would become completely unconscious with her jaw absolutely rigid—this without warning and at indefinite times during the day, limited to once daily. Response to calcium was immediate. She has had these attacks about every other day to every day since February 21, has had calcium in the vein and intramuscularly, solution of parathyroid, viosterol and vitamin D and calcium by mouth but the attacks continue. Between times she is perfectly well, although her appetite is poor and her normal red blood count has fallen. Please advise as to prognosis, treatment and value of blood transfusions.**

M.D., Oklahoma.

ANSWER.—Unfortunately nothing is said in this patient's record concerning the level of blood calcium and phosphorus. While tetany is suggested as the diagnosis by the history of pregnancy, the galactorrhea, the symptoms as outlined and the responses to calcium therapy, the diagnosis of calcium deficiency has not been established with certainty. Until the diagnosis is based on a definite demonstration of the lack of calcium, the possibility of other forms of tetany and of hysteria should be considered.

In the event that the case is one of tetany and the calcium content of the blood is depleted, continuation of treatment along the lines now employed eventually should lead to cure. It is necessary, of course, to maintain the blood calcium at or above the normal level. In many cases of tetany the oral administration of dihydroxytachysterol proves helpful. This is particularly valuable in chronic cases when treatment must be continued over a long period of time.

In the event the blood chemistry is found normal and continues so on rechecking, the management of the case should include some form of psychotherapy along with liberal use of sedatives.

Blood transfusion does not seem to be indicated and would probably prove futile.

MUMPS AND PURPURA

To the Editor:—**Please advise as to the occurrence of purpura as a sequela three weeks after the onset of an attack of mumps. Holt and McIntosh, as well as Brenneman's Pediatric System, fail to make any mention of it. The second edition of Griffith and Mitchell mentions it as a rare complication, but I find no reference in the past three years in the *Quarterly Cumulative Index Medicus*.**

Henry Mitchell Glaubman, M.D., Hartford, Conn.

ANSWER.—The occurrence of purpura three weeks after the onset of an attack of mumps may be an isolated phenomenon which has nothing to do with the mumps. The reference in Griffith and Mitchell (The Diseases of Infants and Children, ed. 3, Philadelphia and London, W. B. Saunders Company 1933) merely states that "among other unusual complications and sequelae may be mentioned: erythema, purpura, endocarditis, pericarditis, polyarthritis, peritonitis, laryngeal stenosis, appendicitis and pneumonia." They do not mention that it may occur weeks after the onset of mumps, and petechiae may of course occur during the course itself of any severe infection. Obviously the question cannot be answered satisfactorily without knowing all the details of the case.

PHOTOGRAPHIC INDUSTRY AND CATARACTS

To the Editor:—**Do you know of any instance on record in which cataracts have been produced by exposure to chemicals used in the processing of motion picture films? There is a case in this country at the present time in which a claim is being made that cataracts are produced in this way. I do not know the details, but the question has come to us as a photographic industry. I know of no instance in which this has been true.**

W. A. Sawyer, M.D., Rochester, N. Y.

ANSWER.—As far as the literature shows, there is no such case on record. There are only three ways in which a chemical substance could be absorbed to produce cataractous changes in the lens: (1) through the respiratory passages, (2) through the alimentary tract and (3) through the skin. The first two are, of course, out of the question. The third method is possible, but, as far as known, none of the chemicals used in the photographic industry will produce changes in the crystalline lens.